

IRON AGE

The

January 29, 1959

A Chilton Publication

The National Metalworking Weekly



**Spray Brazing:
New Way to Bond
Tough Jobs** P. 85

**Steel Labor Outlook:
What PA's Are Thinking** – P. 47

**How to Get Set
For a Rising Market** – P. 52
Digest of the Week – P. 2-3

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The IRON AGE

January 29, 1959—Vol. 183, No. 5

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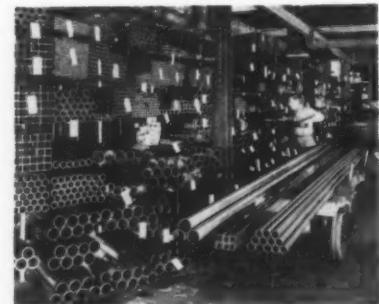
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ELECTRIC-ARC STEEL-MAKING

Preheater Cuts Costs—A scrap preheater may cut electric-arc steel-making costs by 22 pct or more. It's likely to greatly reduce melting time and provide better carbon control. Test data from a laboratory unit proves its feasibility for industry. P. 90

WEAR-RESISTANT PLATING

In Oxides or Carbides—Very small particles are dispersed in a metal matrix. The composite material, either as a plated film or elec-

troform, forms a tough surface with high wear resistance. Automation allows high production rates of application. P. 94

STEEL PLUS FOAM

For Building Panels—The mating of steel and foam produces a panel that is light and strong with excellent insulating qualities. A metering device charges steel shells with precise amount of plastic. P. 97

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Without Bushings—The stub drilling concept can save tools, time and money. Short, rigid drills last longer, can be changed quickly, and are often used without bushings. P. 98

MARKETS & PRICES

MARKET PLANNING

How Westinghouse Does It—Planning for a rising market is a complex business. A lot of money rides on decisions made to cope with rising demand. Here's how Westinghouse does it. P. 52

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CRISIS IN LABOR

First of a Series—Next week The IRON AGE starts a new series of articles reporting and interpreting 1959's critical labor developments. Industrial psychologist Dr. R. N. McMurry leads off with an analysis of management weakness.

SPRAY BRAZING: A new variation of the method proves ideal for joining in hard-to-reach places, such as found in heat exchangers. Observing an operator apply the process is H. E. Miller, Chief Mfg. Engineer, Carrier Corp. P. 85

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Sales Breakthrough—Aluminum use in residential housing is growing rapidly. This year consumption in home building could top 430,000,000 lb. P.

MISSILEMAKING

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Big Increase Unlikely—There won't be a sharp boost in defense purchases unless Congress pads out President's budget. Plans now call for 1 pct rise in spending in year starting July 1. P. 130





Vita-lectric broiler by Clark Industries of Nashville, Tenn., features shelving made from Penmetal expanded metal.

HANDSOME, HARDY SHELVING

still another use for Penmetal expanded metal

To appreciate why Penmetal expanded metal is becoming more and more popular with designers, note the advantages gained from its use as shelving for the Clark Vita-lectric broiler.

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Expanded metal is used in the broiler drawers, too.



a name to remember

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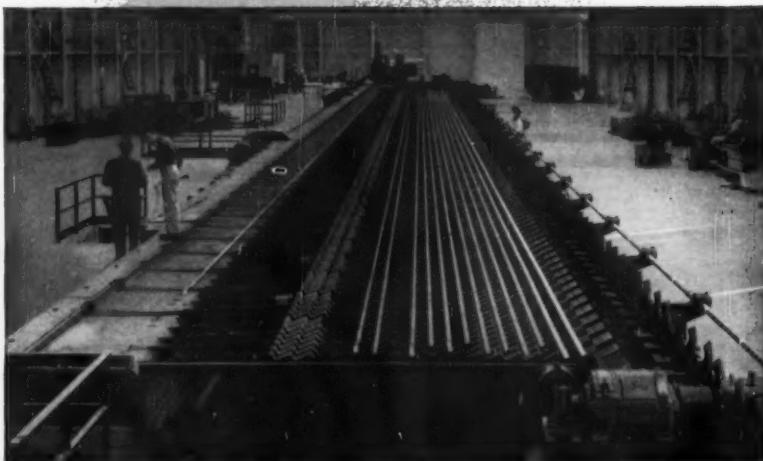
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to
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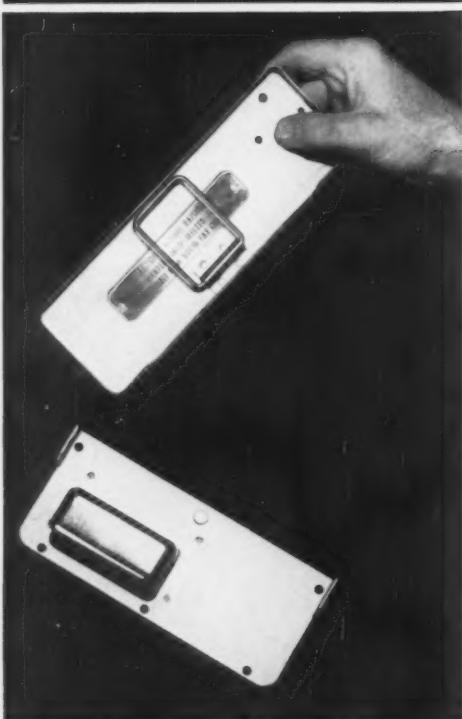
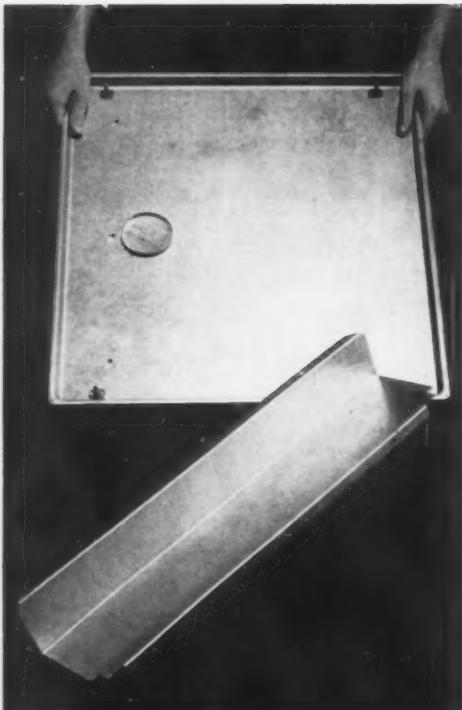


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Things To Hope For Are They Too Far-fetched?

In his various messages to the nation Mr. Eisenhower has bucked the trend of the times. He has called for action against inflation. And he has pointed a way he thinks we can go.

He has had the political courage to say that wage boosts which are greater than productivity gains are bad for all of us. Organized labor leaders will be incensed at this. But the vast body of workers may eventually side with the President.

Certainly the President has made it hard for the spenders to up-end the pork barrel—as they had every intention of doing. If they do that now they may commit political suicide. At least the President has firmly planted such an idea in their minds.

The plans of the Administration to make a long-term counter attack on inflation by setting up a special committee, by suggesting reform in the Full Employment Act, and by other moves displays anything but a defeatist attitude.

Does all this mean we will have paradise tomorrow? Hardly. But it does give us some hope that might not have been present before. All of us are still going to have trouble practicing strict self-discipline. The Administration is going to try and do its part better than it has done in the past.

Is it too much to hope that some day Dave McDonald and management will sit down and figure out what is best for the country first? Maybe at this time it is too naive to expect such a thing to happen. But you never can tell.

Certainly some responsible labor leaders are just as worried about the nation's future—and thus theirs—as are businessmen. The fact that they have not shown much enthusiasm for doing anything about it is more or less natural in the union game. But even that game must change some day if organized labor is to escape a body blow from a belatedly enraged public.

It may be that Mr. Eisenhower has started a grass roots movement that will cement all parts of the country: Those who are looking for sane public spending, those who favor proper but not outlandish defense spending, those who call for a painful look at our foreign trade (both export and import).

If these few things are too much to hope for, then this country is indeed in jeopardy. Yet in spite of all the talk about losing our heritage it takes only an unselfish and strong leader to awaken us to our responsibilities.

That time is at hand!

Tom Campbell
Editor-in-Chief

Purchasing Week
McGRAW-HILL'S NATIONAL NEWSPAPER OF PURCHASING

Vol. 1 No. 41

New York, N. Y., October 13, 1958

P.A.'s Hit Back
Steel
In

Financing Inventories
To Become Tougher

Public Buyers

Washington—The cost of borrowing money is going up. Eventually it will get tougher to obtain financing for inventory growth although bankers appear to have plenty of money for that type of borrowing now. This is the credit outlook from a purchasing point of view over the next six months as seen by government officials specializing in finance. It stems from a drive by the Federal Reserve and Administration to halt inflation by tightening credit. Reports from bankers around the country indicate general agreeability toward short term loans, but a growing reluctance for long term, capital goods type of borrowing already's developing but not in all areas. So far inventories have not been

\$6 A YEAR U. S.
AND CANADA
\$25 A YEAR
FOR OVERSEAS

... Steel users may find
tighter inventory controls
the best hedge

"Let the other fellow carry the inventory" is a well-tried business principle that is taking on added significance for many manufacturers today.

As featured in a recent issue of PURCHASING WEEK, the cost of borrowing money is going up. Over the next six months, inventory growth financing will get tougher. Even now, the publication pointed out, there's a growing reluctance by bankers to make long-term, capital-goods type loans. The newspaper concluded that interest rates, too, are heading rapidly toward the high levels reached during 1957's tight-money period.

Faced with these new complications, steel buyers may well find continuance of recession-born, modified inventory policies the best hedge against tight money and higher interest.

For example, during the recent slump many companies proved to themselves that the varied facilities of steel service centers cut costs all

along the line. They avoided long-term commitments and substantially reduced their need to borrow money. They released precious working capital for more productive purposes . . . freed valuable storage space . . . reduced handling costs and cut scrap loss, interest, insurance, taxes, etc.

This kind of cost-conscious buying is especially sound when you consider the unusually broad scope of Ryerson stocks, and the speed and dependability of Ryerson services. Buying cut-to-size steel—any kind, shape, size and quantity—gives you complete flexibility to meet quick shifts in production schedules. And you have the added assurance of getting uniform, high-quality steel—unequaled Ryerson certified quality.

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Transistors Aid Ignition

A transistorized low-voltage ignition system anticipates future ignition demands created by the trend to higher horsepower and higher compression engines. It has been tested for thousands of miles in cars with 12-to-1 compression ratios. It's most likely to appear first in military combat vehicles. Advantages are said to be extended spark-plug life, instantaneous starting, and less fuel fouling and pre-ignition.

Cold Rolled Sheet Tightens

Reports of carryovers of cold-rolled sheet mill orders running to as much as four weeks are popping up in the Midwest with increasing frequency. With mills at capacity, and producers confining orders to historical buying patterns, attempts at inventory building are running into heavy weather. A few report they are actually loosing inventory in a period when they had planned to build it up.

Semiconductor Strain Gage

Researchers at Bell Labs have measured the piezoresistive effect in such materials as silicon and germanium. Unexpectedly, this effect is so pronounced that it permits the construction of very sensitive devices for measuring strain. These units have nearly all qualities of an ideal gage.

Medical Checks Aid Probes

Pleading sick in order to avoid testifying before congressional committees is no longer a fool-proof dodge. Government doctors now examine "sick" patients to find out if they are faking. The long list of witnesses needed in the Senate labor-management clean-up probe started the trend. Senators decided to hold "sick call" to aid the stricken.

Treat Soil in Tunnel Work

After conventional methods had failed in a sand-water area of a tunnel-driving project, a chemical solidification process enabled safe completion of the tunnel. Solutions of sodium silicate

and calcium chloride, forced into the water-bearing sand, consolidated the sand so that excavation could be done with pneumatic spades. Other applications are in building foundations, bridge construction, dams, piers and highways.

Ultrasonics Detects Fatigue

A research report describes a resonant-type fatiguing machine and equipment to measure waves in a fatigued specimen. The setup was designed for early detection of fatigue damage in aluminum aircraft structural materials. The electro-acoustic driving unit uses ultrasonic waves in the megacycle range.

Aluminum Engine Transition

Automakers are studying plant changes needed to process aluminum blocks and heads. Transition may be easier than first thought. Much present equipment may be modified, with new provisions for chip handling, these sources say. Experience of diesel manufacturers—who have been making some aluminum engines right along—suggests no great savings in manufacturing costs or production times are likely.

Low-Cost High-Temp Alloy

A new family of iron-aluminum-manganese alloys combine light weight, excellent cold workability, high-temperature strength and oxidation resistance. The development gives promise of eventually producing a low-cost, poor man's high-temperature alloy without the use of strategic metals such as chromium and nickel.

See Two Sides in Tax Bill

House leaders and Treasury experts tag as "impractical" the Herlong-Baker tax-cut bill. They worry over the loss of revenue (\$18.5 billion in the next five years) spelled out in the bill. But other tax experts point out the government would gain much new revenue from new investment incentives offered. Bill calls for realistic depreciation of plant and equipment, plus cuts in income taxes.



"TASK-FORGING" . . . a new metal forming idea!

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At this point, COMMERCIAL's "Task-Forging" group—double-teaming with the manufacturer—took up the challenge. It came up with the right answers and convinced the manufacturer that the housing could be produced as a closed-die forging—on an 8" upsetter from 4½" round bar stock by the internal displacement method. The result: A stronger part at less cost per unit. And here's why.

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LETTERS FROM READERS

Annual Issue

Sir—You are to be complimented on the January 1 issue of the always valuable IRON AGE, with particular emphasis, of course, on the metalworking surveys by industries.

We are taking advantage of your offer to request reprints of several of these surveys.—G. W. Phelps, Otaco Ltd., Orillia, Ontario, Canada.

Sir—Your editorial "Are You Giving Up? Don't! You Can't Afford to!" (Jan. 1 issue) was one of the most striking bits of writing to come before my eyes in a good long time.

For exposition of timely, sensible thinking delivered with just the right amount of force about a highly important matter I just do not see how anyone could beat it.

I hope and expect that it will be reprinted in other publications. It would be a fine thing if some of the large concerns around our country would have it reproduced in their company magazines.—W. R. Odell, Chicago.

Ultrasonics

Sir—I have some comment on your recent article (Nov. 20 issue, p. 98) describing the Westinghouse approach to generating intense ultrasonic energy.

As a manufacturer of equipment using both magnetostrictive and barium titanate transducers (as well as a new type combining the advantages of both of these), may I state it is possible to generate intense ultrasonic energy by so many means that a "sales pitch" based on any one type is misleading.

The desired level of ultrasonic activity is a rather nebulous figure

—measured these days by such diverse tests as the "finger dip method," the erosion of aluminum foil, and noted cleaning speed.

The Ultrasonic Manufacturers Association is now formulating a standard which will define ultrasonic activity and permit it to be measured by readily available tools.

Until this standard is available and in use, may I suggest that potential users of ultrasonic equipment satisfy themselves that the equipment does two things. First, it properly cleans the parts at the desired rate. Second, it does this task reliably at lowest possible initial cost. The type of transducer should be of minor consideration to the customer.—R. L. Rod, president, Acoustica Associates Inc., Mineola, N. Y.

Michigan View

Sir—We noted with interest your article in the December 18 issue "Why Industry Shuns Michigan."

If you have reprints available I would appreciate 100 copies.—P. A. Johnson, vice president, Dade Corp., Grand Haven, Mich.



"No tranquilizers for me! The last time I tried them I gave four people raises before the effect wore off!"



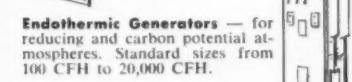
WILLIAM C. DIMAN,
Atmosphere Equipment Specialist
1st, reports . . .

MODERN METALS DEMAND MODERN ATMOSPHERES

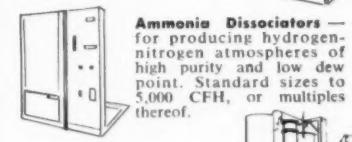
Ever since 1927, when Hayes perfected the first controlled-atmosphere furnace, we have made a steady effort to further the technology of protective atmosphere heat treating. By recommending proper atmosphere equipment, we have helped customers increase production, obtain uniform product quality, and save processing time and trouble. Today, our atmosphere generator line, probably the most comprehensive in the business, includes:



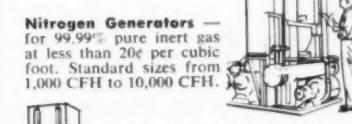
Exothermic Generators . . . for oxidizing or medium-reducing type atmospheres. Standard sizes from 200 CFH to 50,000 CFH.



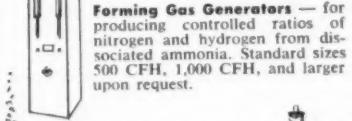
Endothermic Generators — for reducing and carbon potential atmospheres. Standard sizes from 100 CFH to 20,000 CFH.



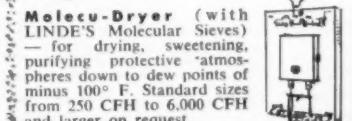
Ammonia Dissociators — for producing hydrogen-nitrogen atmospheres of high purity and low dew point. Standard sizes to 5,000 CFH, or multiples thereof.



Nitrogen Generators — for 99.99% pure inert gas at less than 20¢ per cubic foot. Standard sizes from 1,000 CFH to 10,000 CFH.



Forming Gas Generators — for producing controlled ratios of nitrogen and hydrogen from dissociated ammonia. Standard sizes 500 CFH, 1,000 CFH, and larger upon request.



Molecu-Dryer (with LINDE'S Molecular Sieves) — for drying, sweetening, purifying, protective atmospheres down to dew points of minus 100° F. Standard sizes from 250 CFH to 6,000 CFH and larger on request.

Hayes offers more than just equipment. Our engineering organization and experimental lab are ready to help make sure you get a "Results Guaranteed" solution to your heat treating or protective atmosphere problem. Write for descriptive bulletins.

C. I. HAYES, INC.

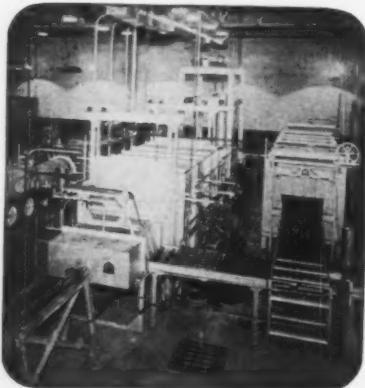
Established 1903

821 WELLINGTON AVE. • CRANSTON 10, R. I.

ELECTRIC FURNACES

It pays to see HAYES for metallurgical guidance, laboratory facilities, furnaces, atmosphere generators, gas and fluid dryers.

LABOR SAVED 50% PRODUCTION UP 50%



R-S... CONTINUOUS HARDENING, QUENCHING, DEGREASING, DRAWING LINE

It's one operation instead of four to heat treat cylinder liners at Continental Motors with the R-S equipment. Electric heat treating line is one complete unit ... temperature is 1575° F. for hardening, it is oil quenched and the draw furnace operates at 1100° F. The atmosphere is controlled through hardening and quenching operations and capacity is 1,300 gross lbs. per hour.

R-S Heat Treating unit requires only two men instead of four with the conventional type. Production rate is up 50% . . . quality is uniformly high . . . and the unit paid for itself in 22 months.

Why not put these savings into your heat treating? Write today for your copy of the booklet on better heat treating. Ask for R-S 200. No obligation.

R-S FURNACE CO., INC.
North Wales, Pa.



Car Hearth Furnaces
Continuous Furnaces
Rotary Type Furnaces



FATIGUE CRACKS

Helpful Helper

We like this plating poem which appeared in the Observer, published by the Metal & Thermit Corp., Rahway, N. J.

When he left Friday night,
His chrome was all right.
The temperature would be controlled,

So Monday his plating
Could start without waiting
To heat up a bath that was cold.

"I don't like the looks
Of those anodes and hooks,"
He thought as he walked down the path.

His new helper, Jake,
He sent back to take
The anodes out of the bath.

Monday was dank.
He strolled to his tank—
But he never completed his yawn.
There was something amiss.
A dark brown abyss!
His chrome plating bath was gone!
His helper, in doubt
After anodes were out,
The heat control bulb had raised too.

In the cold air it shivered—
While steam it delivered—
And boiled down the bath to a goo.

How Was That Again?

Everyone has troubles. But not everybody can combine and compound them as well as one workman did. For a blow-by-blow account read his letter requesting sick leave:

"Respected Sir—When I got up to the building, I found the tornado had knocked some brick off the top. So I rigged up a beam and a pulley on top and hoisted up a couple of barrels of brick.

"After I had fixed the building there was a lot of brick left over. So I hoisted the barrel up again and secured the line at the bottom. Then I went up and filled the barrel with

the extra brick, returned to the bottom, and cast the line off.

"Unfortunately, the barrel of brick was heavier than I was and when the barrel started down, I started up. I hung on and halfway up I met the barrel coming down and received a severe blow on the shoulder.

"I then continued to the top, banging my head against the beam and getting my finger jammed in the pulley.

"When the barrel hit the ground, it bursted its bottom, allowing the brick to spill out. I was now heavier than the empty barrel and so started down again at high speed. Halfway down, I met the barrel coming up and received severe injuries to my shins. When I hit the ground, I landed on the brick, getting several painful cuts from the sharp edges.

"At this point, I must have lost my presence of mind, because I let go the line. The barrel then came down giving me another heavy blow on the head and putting me in the hospital."

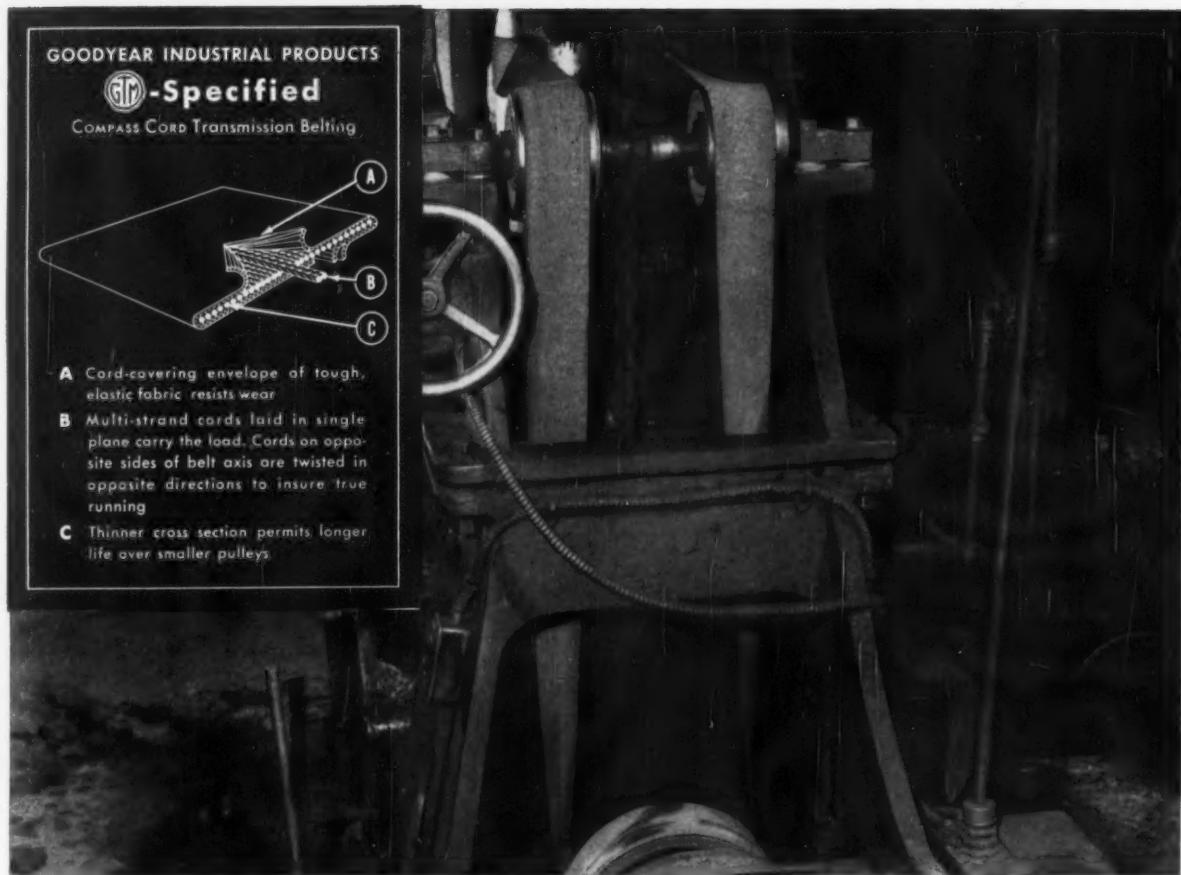
Electronic Medic

Patients who like to pour their troubles into the doctor's ear may be in for a shock.

Tomorrow's physical may be handled by an electronic machine which will diagnose in thirty seconds, then present findings to the sufferer on a 3 x 5 in. punched card.

This "electronic M.D." is predicted by Irwin Steinberg, general manager, Vibro-Ceramics Div., Gulston Industries, Inc., Metuchen, N. J. His company now has an electronic system — built for space pilots — which can record medical data and relay it back to earth for doctors to study.

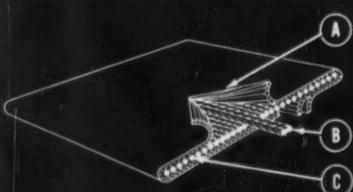
"When other techniques are perfected," says Mr. Steinberg, "a man on the street will be able to step into a wired medical suit, and get a complete physical in half a minute."



GOODYEAR INDUSTRIAL PRODUCTS

G.T.M.-Specified

COMPASS CORD Transmission Belting



A Cord-covering envelope of tough, elastic fabric resists wear

B Multi-strand cords laid in single plane carry the load. Cords on opposite sides of belt axis are twisted in opposite directions to insure true running

C Thinner cross section permits longer life over smaller pulleys

Weathers rough grind for 3 years—not 3 months

Belting the rough ball-bearing grinders used by this New England firm is no cinch. They have a tough combination of horizontal and vertical drives. And each belt must make two quarter turns. So it's easy to see why previous belts stretched and slipped—had to be replaced in as little as 1 month, never went much more than 3.

But the G.T.M.—Goodyear Technical Man—had a suggestion: his COMPASS CORD Transmission Belt. It's sinewed with endless load-carrying cord—has a thin cross section for longer life over

small pulleys. Result: the G.T.M.'s highly stretch-resistant belt ended take-up problems—minimized maintenance—boosted belt life a phenomenal 3 years or better.

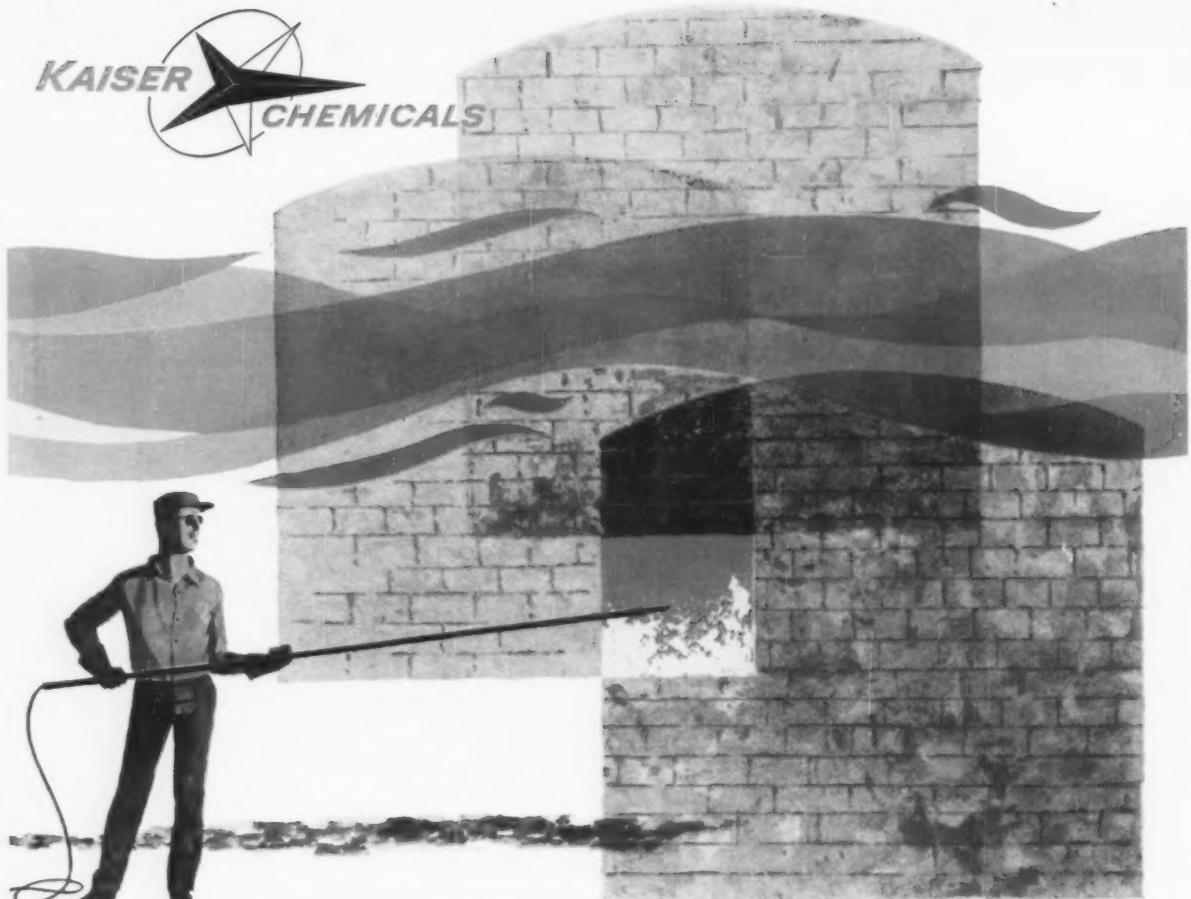
And that's typical of the G.T.M.'s success in belting the high costs out of vital production operations. To cash in on his unique moneysaving abilities—wherever industrial rubber products are used—contact your Goodyear Distributor—or write Goodyear, Industrial Products Division, Akron 16, Ohio.

COMPASS CORD BELT by

GOOD  **YEAR**
THE GREATEST NAME IN RUBBER

Compass—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

IT'S SMART TO DO BUSINESS with your Goodyear Distributor. He can give you fast, dependable service on Hose, V-Belts, Flat Belts and many other industrial rubber and nonrubber supplies. Look for him in the Yellow Pages under "Rubber Goods" or "Rubber Products."



3 Campaigns with open hearth endwalls of Kaiser Periclase Chrome Brick!

- "Took off #6 Open Hearth and found Kaiser Periclase Chrome Brick looked so good in the endwalls that they were left in for the third campaign."
- "After two campaigns of 90 and 106 heats, Brand 'A' were removed from the down-river end and Kaiser Periclase Chrome Brick are going to complete a third campaign in the up-river end."
- "Furnace this month finished third campaign of 176 heats, and at that time Kaiser Periclase Chrome endwall had gone through 562 heats. At this writing, this endwall has approximately 600 heats..."

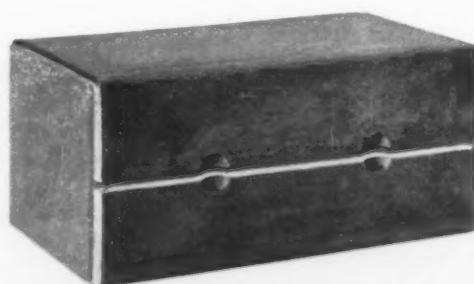
Every month reports like these bring more and more dramatic evidence of improved endwall service. And more often than not, these reports show how *new shop records* have been established with Kaiser Periclase Chrome Brick. Here are the properties that make possible such performance:

- 1. Volume Stability.** Chromite content is the minimum amount necessary to provide resistance to thermal shock. Lowering of chromite also reduces swelling in presence of iron oxide, thus minimizes buckling and peeling.
- 2. Uniform High Strength** because ceramic bond is formed before the chemical bond burns out.
- 3. Outstanding Resistance to Distortion and Shrinkage** because there is no liquid phase in the conversion from chemical to ceramic bond.
- 4. Excellent Resistance to Chemical Attack** by furnace fumes, iron oxides and slags is assured by high magnesium content,

maximum brick density (low porosity) and chemically stable composition.

Make a comparison test and see how much more life you get with Kaiser Periclase Chrome Brick. Your Kaiser Chemicals Sales Engineer will be glad to help.

Call or write Kaiser Chemicals Division, Dept. S9112, Kaiser Aluminum & Chemical Sales, Inc., at any of the regional offices listed below:
 PITTSBURGH 22, PA. 3 Gateway Center
 HAMMOND, IND. 518 Calumet Building
 OAKLAND 12, CALIF. 1924 Broadway



Refractory Brick & Ramming Materials • K/R Gunning Systems
 Castables & Mortars • Magnesite • Periclase • Deadburned Dolomite • Aluminas

COMING EXHIBITS

Western Metal Show—March 16-20, Pan-Pacific Auditorium and Ambassador Hotel, Los Angeles. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

Corrosion Show—March 16-20, Chicago. (National Assn. of Corrosion Engineers, 1061 M & M Bldg., Houston 2, Texas.)

1959 Nuclear Congress—Apr. 5-9, Cleveland Auditorium, Cleveland. (Engineers Joint Council, 29 W. 39th St., New York 18.)

Welding Show—Apr. 6-10, International Amphitheatre, Chicago. (American Welding Society, 33 W. 30th St., New York.)

Engineered Castings Show—Apr. 13-17, Sherman and Morrison Hotels, Chicago. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

Packaging Exposition—Apr. 13-17, International Amphitheatre, Chicago. (American Management Assn., 1515 Broadway, N. Y.)

Powder Metallurgy Show—Apr. 20-22, Sheraton - Cadillac Hotel, Detroit. (Metal Powder Industries Federation, 130 W. 42nd St., New York 36.)

Design Engineering Show—May 25-28, Convention Hall, Philadelphia. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Material Handling Show—June 9-12, Public Auditorium, Cleveland. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

Industrial Finishing Show—June 15-19, Detroit Artillery Armory, Detroit. (Information: H. J. McAleer, 3171 Bellevue, Detroit 7, Mich.)

MEETINGS

FEBRUARY

American Society for Testing Materials—Committee Week meeting, **Continued on P. 16**

NEW!



Kidde dry chemicals kill more fire faster!

Granted top rating by Underwriters' Laboratories, these two new Kidde dry chemical extinguishers pack the *extra* punch you need to knock out stubborn blazes. These 2½- and 5-pound Kidde units put out as much fire as eight and sixteen one quart carbon tetrachloride portables respectively. They are perfectly balanced for fast action, are light in weight, easy to operate even while wearing gloves. And — no pin to remove, no valves to turn, no inverting or bumping needed. Just aim at fire and press the lever! Pressurized, they can be easily and quickly recharged with air or nitrogen. No pressure cartridge needed. Write for more information on these new Kidde extinguishers — easiest-to-operate dry chemical portables on the market today!

Kidde



Walter Kidde & Company, Inc.
150 Main St., Belleville 9, N. J.
Walter Kidde & Company of Canada Ltd.
Montreal — Toronto — Vancouver



from **CONTINENTAL**
a lustrous new
TINNED WIRE

Here's smoothness and luster you rarely get in tinned wire. Continental's special technique makes possible an enduring, uniformly bright finish . . . a wire so bright that it can replace plated wire on many products. It retains its brightness for long periods of time in normal use. Continental tinned wire meets your needs for quality and workability and is available in almost any temper and analysis in medium low carbon and low carbon steels.

FINE—16 gauge through 30 gauge, in 8" diameter coils

COARSE—20 gauge through $\frac{5}{16}$ ", in 16" and 22" diameter coils.

For smooth beauty and high degree of perfection in wire, you will want to investigate Continental Tinned Wire. Write or Telephone—today; or return coupon below.

FILL OUT AND RETURN COUPON TODAY

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____

STATE _____

Send Complete Details

Have Salesman Call

CONTINENTAL STEEL
CORPORATION • KOKOMO, INDIANA

PRODUCERS OF: Manufacturer's Wire in many sizes, tempers, and finishes, including Galvanized, KOKOTE, Flame Sealed, Coppered, Tinned, Annealed, Liquor-Finished, Bright and special shaped wire. Also Welded Wire Reinforcing and Galvanized Fabric, Nails, Continental Chain Link Fence, and other products

EXHIBITS, MEETINGS

(Continued from P. 15)

Feb. 2-6, Penn Sheraton Hotel, Pittsburgh. Society headquarters, 1916 Race St., Philadelphia.

American Institute of Electrical Engineers—Winter general meeting, Feb. 2-7, Statler-Hilton and Sheraton-McAlpin Hotels, New York. Institute headquarters, 33 W. 39th St., New York 18.

American Coke and Coal Chemicals Institute—Western regional meeting, Feb. 5, Drake Hotel, Chicago. Institute headquarters, 711 14th St., N.W., Washington, D. C.

American Management Assn.—Marketing conference, Feb. 9-11, Statler-Hilton Hotel, New York. Association headquarters, 1515 Broadway, New York 36.

The Metallurgical Society of AIME—Annual meeting, Feb. 15-19, St. Francis, Sheraton-Palace, and Sir Francis Drake Hotels, San Francisco. Society headquarters, 29 W. 39th St., New York.

Association of Steel Distributors, Inc.—Annual convention, Feb. 15-21, The British Colonial Hotel, Nassau, Bahama Islands. Association headquarters, 29 Broadway, New York 6, N. Y.

American Management Assn.—Mid-winter personnel conference, Feb. 16-18, Palmer House, Chicago. Association headquarters, 1515 Broadway, New York 36.

Malleable Founders' Society—Technical & operating conference, Feb. 18-19, Park Manor Hotel, Cleveland. Society headquarters, 1800 Union Commerce Bldg., Cleveland 14.

Alloy Casting Institute—Winter meeting, Feb. 26-27, Boca Raton Hotel, Boca Raton, Fla. Institute headquarters, 286 Old Country Rd., Mineola, N. Y.

ELECTROMANGANESE®

just naturally takes to alloying

High purity (99.9%) and inherent compatibility make Electromanganese an ideal alloying element. The absence of silicon, carbon, and other impurities gives ferrous and nonferrous metallurgists an alloying element that produces uni-

form results . . . provides a whole string of selected and unique properties. Electromanganese alloy combinations run the metal gamut from A to Z. Here's a sampling of the properties Electromanganese adds to—

	Aluminum	desirable hardness with no harmful effect on corrosion-resisting properties; improved strength at elevated temperatures
	Copper	high strength and high resistance to chemical corrosion; also provides unusually high damping characteristics and electrical properties
	Iron	high strength, toughness, good drawing and machining properties; also counteracts the harmful effects of sulfur
	Magnesium	improved resistance to corrosion by salt water, increased yield strength of the wrought alloys; also confers weldability
	Nickel	improved malleability, high heat-dissipating capacity and high resistance to oxidation and corrosion at high operating temperatures
	Titanium	high strength to weight ratio combined with good formability
	Zinc	increased strength, workability, and corrosion-resisting properties

Electromanganese—Foote's electrolytic manganese—is also used as a substitute for rarer, more expensive metals . . . as a melt deoxidizer and scavenger. Electromanganese may well be the key to your search for newer, better metals.

To find out more about the potential of Electromanganese you ought to have our Bulletin 201. Write letterhead request to Technical Literature Dept., Foote Mineral Co., 438 Eighteen West Chelten Building, Philadelphia 44, Pa.



FOOTE MINERAL COMPANY

Electrolytic Manganese Metal • Nitreimang • Hydrogen-Removed Electromanganese • Nickel • Rimex Manganese Sulphide • Welding Grade Ferro Alloys • Commercial Minerals and Ores • Lithium Metal, Chemicals, Minerals • Zirconium, Titanium, Hafnium (Iodide Process)



Toolmaker's Skill is the marvelous science of making things fit.

Making tools for toolmakers



Gage Blocks, so important to toolmaker's precision measurements, obtain their own close accuracy through the use of Norton lapping machines. Norton lappers are among industry's most valuable "fit and finish" tools.



Die Making gets increasingly delicate as the work nears the finish. Here the toolmaker adds his final touch, using a Norton tiny grinding wheel — preferred because his work must be perfect.



Touching Up a high speed milling cutter is often done with an India brand oilstone file. Final honing is frequently done with an Arkansas oilstone file. Norton and its divisions are the important sources for both.



Micrometers Themselves are a product of precision manufacture and precision-prepared abrasives. Here a man is grinding a micrometer thread die with a Norton V-face grinding wheel. There are more than 200,000 types of Norton grinding wheels.

Making better products...



... puts a man on his mettle

Inventing a tool to make other tools better was the work of an unknown prehistoric genius. A nice start!

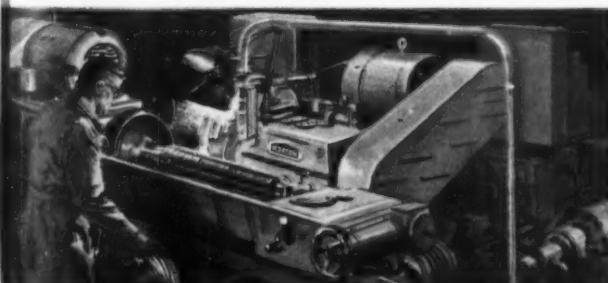
Thousands of years later — here at Norton Company — a constant improvement of tools for more efficient production is still going on. Bigger, better and more important as science opens new vistas. Based on this invention, toolmaking has become a great industry serving all industry.

Norton abrasives are chief among "toolmakers' tools" — respected and preferred wherever toolmakers are at work. It is this craft of the toolmaker that turns the designer's ideas into practical production implements.

On this page are a few of the many modern ways in

which Norton helps the man who uses the micrometers. Further along — on the production line — Norton abrasives keep the work coming out as it should. This is how Norton serves — making better products . . . to make your products better.

NORTON
A B R A S I V E S



Precision Finishing to extremely close tolerances is possible on this large Norton grinding machine. Precision engineering gave it a "feather touch". Here a machine spindle is being finished to an accuracy of plus or minus 1/10 of a thousandth of an inch.

Around the world and still expanding

Grinding Wheels Plants — Worcester, Mass.; Santa Clara, Calif.; Hamilton, Ontario; South Africa; England; France; Germany; Italy; Brazil.

Bohr-Manning Plants — Coated Abrasives and Pressure-Sensitive Tapes — Troy, N. Y.; Canada; Australia; France; Northern Ireland; Argentina; Brazil.

Abrasives Plants — Huntsville, Alabama; Chippawa, Ontario; Cap-de-la-Madeleine, Quebec; Brazil.

Grinding and Lapping Machine Plant — Worcester, Mass.

Refractories Plant — Worcester, Mass.

Electro-Chemical Plants — Chippawa, Ontario; Huntsville, Alabama; Cap-de-la-Madeleine, Quebec.

Norton Pike Plant — Sharpening Stones — Littleton, New Hampshire.

Bauxite Mines — Bauxite, Arkansas.

General offices: Norton Company, Worcester, Mass.

to make your products better

Which of these **SKF** bearings fits the needs of your design?

SKF continually produces all of these standard bearings—in countless sizes and variations—in production quantities. And practically all of them have exclusive features that benefit you.

Take the spherical roller bearing, for example. Recently re-designed, it now offers 25 to 50% increased capacity and 2 to 3½ times longer service life. Yet it's a standard **SKF** bearing—promptly available in over 130 standard sizes ranging from 2.4" to 53.5" O.D., with every possible combination of seals, shields and adaptors to meet your specifications.

But why not get full details on this—or any other—**SKF** bearing? Each is made to do an efficient, economical job for you. Call any one of the 25 **SKF** sales offices today.

5906



Cylindrical
Roller Bearing



Spherical Roller Bearing



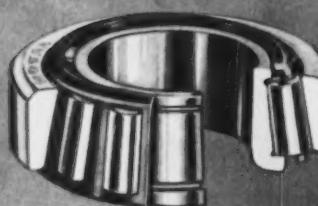
Angular
Contact Bearing



Spherical Roller Thrust Bearing



Single Row
Deep Groove Bearing



Tyson Tapered Roller Bearing



Spherical, Cylindrical, Ball, and **Tyson** Tapered Roller Bearings

EVERY TYPE—EVERY USE
SKF

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

*REG. U. S. PAT. OFF.

Power-Up with new
Westinghouse *Life Line H*
d-c motors



Cleaner, cooler operation . . . less maintenance . . . longer, trouble-free life

HERE'S WHY: Ordinary d-c motor ventilation systems draw air in at the commutator end, contaminate windings by drawing carbon dust from commutator brush wear *into* the machine. In the new Life-Line® "H," this air flow is reversed. Air and carbon dust are expelled at commutator end . . . assuring cleaner, cooler windings . . . longer motor life . . . less maintenance.

Plus . . . these other important advantages . . .

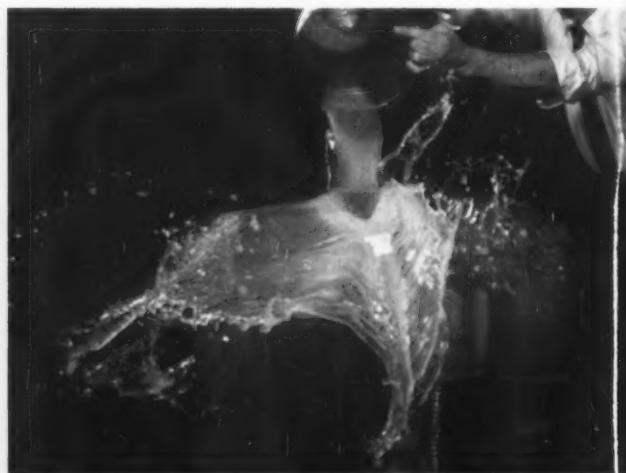


YOU CAN BE SURE . . . IF IT'S **Westinghouse**

These exclusive features of the new Westinghouse Life-Line **H** d-c motor guarantee top performance . . . longer, trouble-free life

TEN TIMES LONGER INSULATION LIFE . . .
New silicone insulation in Westinghouse Life-Line* "H" d-c motors and generators stands up under temperatures which turn ordinary insulation to a cinder. High-temperature silicone insulation is used with the full complement of iron and copper required for low Class B temperature. Result: Life-Line "H" shrugs off emergency overloads and abnormal ambients to keep production rolling, maintenance down.

GREATER PROTECTION . . . most complete and advanced protection available in dripproof industrial d-c machines. Elimination of uncovered side openings . . . heavy, cast end brackets . . . effective seals throughout . . . all combine to provide outstanding resistance to liquids, vapors and dirt. This means longer life with greater reliability . . . minimum maintenance under all operating conditions.



FASTEST RESPONSE . . . 35 per cent increase in commutating ability . . . up to 55 per cent lower mechanical inertia . . . and up to 30 per cent reduction in electrical inertia mean that the new Westinghouse Life-Line "H" d-c motor provides the fastest acceleration, quickest reversing and closest speed regulation. This means more production, better product quality, minimum complexity of control.

SIMPLIFIED MAINTENANCE . . . With the new Life-Line "H," maintenance is not only substantially reduced but periodic inspections are also greatly simplified. For example: as shown above, Uniforce brushholder fingers lock out . . . brushes can be inspected or changed with one hand. And Uniforce tension remains constant throughout brush life . . . no need to adjust pressure as brushes wear.

For information about the ways you can profitably put the new Life-Line "H" motor to work, contact your nearby Westinghouse representative. Or, write

Westinghouse Electric Corporation, P. O. Box 868,
3 Gateway Center, Pittsburgh 30, Pa. JI-22122

YOU CAN BE SURE . . . IF IT'S Westinghouse

announcing a new service to
management
of metalworking plants

With this issue, The Dow Chemical Company begins a special series of important advertisements on a subject of dollars-and-cents interest to people in manufacturing.

subject: metal cleaning

These advertisements summarize, for quick reading, an interesting variety of reports on specific metal cleaning problems and applications. These reports come from distributors of Dow solvents who serve industry throughout the United States. We hope these reports will be helpful to manufacturing people concerned with improving metal cleaning and finishing operations, and selecting the right metal cleaning agent for a specific job.

The series begins on the following pages with "Metal Cleaning Report No. 1" in which a new service for users of industrial solvents is offered for the first time. This service provides invaluable technical assistance to every plant with a metal cleaning operation. (In addition, you'll find a complete listing of Dow solvents distributors for easy reference.)

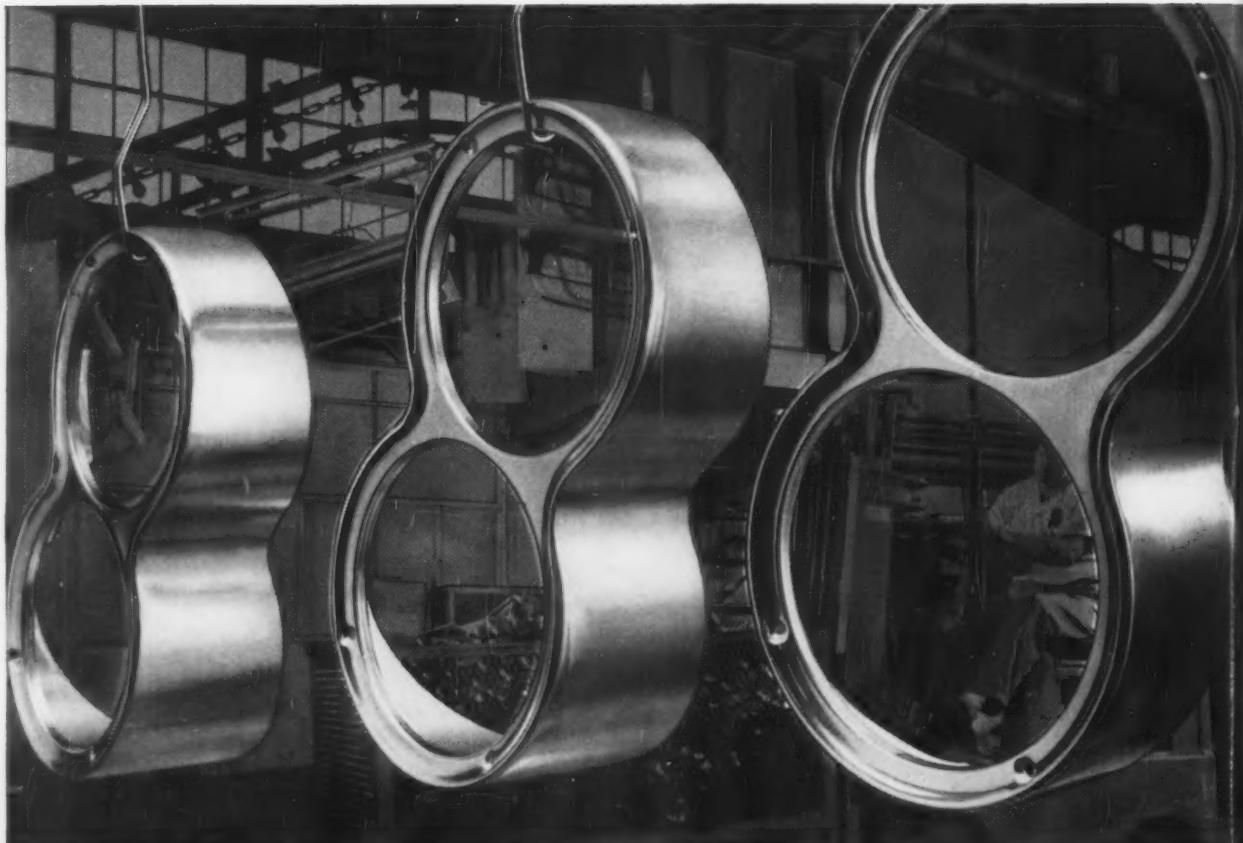


THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN



metal cleaning report no. 1

case histories from your Dow Solvents Distributor



Aluminum headlight assembly being cleaned in vapors of Dow trichloroethylene.

DOW FIELD-LAB TEAM SOLVES DEGREASING RIDDLE

Bay City, Mich.—Manufacturer of auto parts reported faulty still was causing dirty distillate in his trichloroethylene degreasing operation. Dow field team went in, did thorough check of whole operation. Discovered not one, but three trouble spots: (1) Water separator on degreasing unit working improperly; (2) Excess water in stamping oil on parts being cleaned (Dow lab finding); (3) Faulty steam injection valve on still. Valve replaced, water separator repaired, and new stamping oil put in use. Plant now getting good cleaning action first time through vapor degreasing unit using Dow trichloroethylene. Key to solution was skill and thoroughness of trained Dow solvents team.



NEW COLD CLEANER SAVES BIG DOLLAR

Detroit, Mich.—Expensive fluorinated cleaner was being used by manufacturer to remove paraffin oils from refrigeration compressors. Key requirement: clean parts without damaging insulation varnish on motor windings. Dow solvent team invited in. Observations pointed to Chlorothene® (Dow 1,1,1-trichloroethane, inhibited). Compressors cleaned with Chlorothene and air purged immediately after. Lab tests proved Chlorothene cleaned effectively, safely, without damaging insulating varnish. Company switched to Chlorothene, effected dollar savings while getting safe, sure cleaning.

PERCHLOROETHYLENE KEY

Los Angeles, California—Nationally known lock manufacturer was having difficulty cleaning plated metal parts. Door handles and face plates were coming off trichloroethylene degreasing line with marring water spots. Dow called in on problem. Recommended switch to Dow perchloroethylene. Higher boiling point and longer cleaning action resulted in spotless parts. Lock maker now saving time, money, with efficient perchloroethylene degreasing.



STOP-OFF LACQUER STRIPPED FAST

Stratford, Conn.—Major aircraft engine manufacturer was having trouble removing stop-off lacquer used on steel and aluminum parts selectively plated. Parts were being soaked and rinsed in flammable thinner. Process was slow, results unsatisfactory. Dow solvents distributor suggested vapor degreasing with Dow methylene chloride. Parts were run through vapors, then rinsed with spray lance application of m.c. System worked. Lacquer stripped off clean in matter of minutes. Flammability hazard eliminated. Problem marked solved.

Time and time again, Dow solvents distributors help manufacturers improve cleaning and stripping operations. And for two good reasons: (1) Dow offers the widest line of chlorinated solvents for modern industry; (2) Dow backs its distributors to the hilt with technical information and on-the-job help. Chances are good that one of the many Dow industrial solvents can help smooth out your operations, too. Dow solvents are made to high purity standards and each is designed to do a specific job and do it well. For help on your metal cleaning problems, call on the nearby Dow solvents distributor. His name is listed on the next page.

THE DOW CHEMICAL COMPANY • MIDLAND, MICH.



**FREE . . .
TECHNICAL SERVICE
on 24-hour notice**

Your Dow solvents distributor will gladly help you with any problems you're experiencing with metal cleaning solvents. He'll have a trained solvents specialist en route to your plant within 24 hours after your call is received!

Ask your Dow solvents distributor for details.

**CHLOROTHENE®
TRICHLOROETHYLENE
PERCHLOROETHYLENE
METHYLENE CHLORIDE**

See Your Dow Solvents Distributor First!

FOR HELPFUL METAL CLEANING INFORMATION get in touch with your nearby Dow Solvents Distributor



ALABAMA

BIRMINGHAM—Witco Chemical Company (C P M)
BIRMINGHAM—F. H. Ross and Company (C M P T)
MOBILE—Baroda and Page, Inc. (C M)
MOBILE—McKesson & Robbins, Inc. (C M P T)
MOBILE—F. H. Ross and Company (C M P)
MONTGOMERY—Witco Chemical Company (C P M)

ARIZONA

PHOENIX—Braun Chemical Company (C M P T)
PHOENIX—Western Chemical Company (C M P)
TUCSON—Western Chemical Company (C M P)

CALIFORNIA

LOS ANGELES—Braun Chemical Company (C M P T)
LOS ANGELES—Los Angeles Soap Company (C T)
LOS ANGELES—McKesson, Mefford Chemical Division (P)
LOS ANGELES—Pemaco, Inc. (P T)
OAKLAND—B. N. Meadham Company (C)
SAN DIEGO—Braun Chemical Company (C M P T)
SAN DIEGO—Buel Town Company (T)
SAN FRANCISCO—Braun-Knecht-Heimann Co. (C M P T)
SAN FRANCISCO—Phil L. Dostal Company (P)
SOUTH GATE—American Mineral Spirits (P)
SOUTH GATE—Vapor Engineering Corporation (P T)

COLORADO

DENVER—Braun-Knecht-Heimann Company (C M)
DENVER—Chemical Sales Company (C M P T)
DENVER—Merchandise Chemical Company (C M P T)
DENVER—Mine and Smelter Supply Company (C M T)
GRAND JUNCTION—C. D. Smith Co., Chemical Div. (C P T)

CONNECTICUT

HARTFORD—Dwight R. Judson Company (C T)
NEW HAVEN—H. Krevit and Company, Inc. (P T)
SHELTON—Axtom-Cross Company (C M P T)
SOUTH NORWALK—Merchandise Chemical Company (P)

FLORIDA

JACKSONVILLE—F. H. Ross and Company (C M P T)
JACKSONVILLE—Amico Burnett Chemical Co. (C M P T)
MIAMI—Amico Burnett Chemical Company (C M P T)
MIAMI—Biscayne Chemical Laboratories (C M P T)
ORLANDO—Atlantic Chemicals, Inc. (C M P T)

GEORGIA

ATLANTA—McKesson and Robbins, Inc. (C M P T)
ATLANTA—F. H. Ross and Company (C M P T)
ATLANTA—Southern States Chemical Company (C M P T)
COLUMBUS—F. H. Ross and Company (C M T)
DUBLIN—Textile Aniline Chemical Company (T)

IDAHO

BOISE—Van Waters and Rogers, Inc. (C M P)

ILLINOIS

AURORA—River Valley Chemical Company (C M P T)
CHICAGO—Central Solvents and Chemicals (C M P)
CHICAGO—DeMart and Dougherty, Inc. (M)
CHICAGO—General Cleaner Products (T)
CHICAGO—C. P. Hall Company (C M P T)
CHICAGO—Keystone Aniline and Chemical Co. (C P)
CHICAGO—McKesson & Robbins, Inc. (C M P T)
CHICAGO—Merchandise Chemical Company (C M P T)
CHICAGO—Joseph Turner and Company (C M P T)
DECATUR—McKesson & Robbins, Inc. (C M P T)
EFFINGHAM—Wabash Independent Oil Company (P T)
PEORIA—McKesson & Robbins, Inc. (C M P T)
ROCKFORD—Industrial Oil and Chemical Company (C)
ROCKFORD—Viking Chemical Company (C M P T)
SPRINGFIELD—Industrial Chemical Supply (P T)

INDIANA

ELKHART—Miracle Chemicals and Solvents Co. (C T)
EVANSVILLE—Charles Leich and Company (P)
FT. WAYNE—Hoosier Solvents and Chemicals (C M P)
FT. WAYNE—Inland Chemical Co. (C M T)
INDIANAPOLIS—Hoosier Solvents and Chemicals (C M P)
INDIANAPOLIS—Wm. Lynn Chemical Company (C M P)
INDIANAPOLIS—Lynn Solvents Corporation (T)
INDIANAPOLIS—Ulrich Chemical Company, Inc. (T)
KOKOMO—Plating Products, Inc. (P T)
LOGANSPORT—Plating Products, Inc. (P T)
SOUTH BEND—Inland Chemical Co. (C M P T)
SOUTH BEND—Stevens Oil Company (C M P)

IOWA

BETTENDORF—Barton Naptha Company (C M P T)
BURLINGTON—McKesson and Robbins, Inc. (C M P T)
CEDAR RAPIDS—McKesson and Robbins, Inc. (C M P T)
COUNCIL BLUFFS—Barton Solvents, Inc. (C M P T)
DES MOINES—Barton Naptha Company (C M P T)
SIOUX CITY—McKesson and Robbins, Inc. (P)
SUMNER—Overton Chemical Sales (C)

KANSAS

WICHITA—Baroda and Page, Inc. (C M)
WICHITA—Barols and Shores Chemical Co. (T)
WICHITA—Reid Supply Company (C P T)

KENTUCKY

LOUISVILLE—Dixie Solvents and Chemicals (C M P)
LOUISVILLE—Gage Chemical and Supply Company (P)
LOUISVILLE—Merchandise Chemical Company (C M P T)

LOUISIANA

BATON ROUGE—Baroda and Page, Inc. (C M)
LAKE CHARLES—Baroda and Page, Inc. (C M)
NEW ORLEANS—Baroda and Page, Inc. (C M)
NEW ORLEANS—Barlett Chemicals, Inc. (M P)
NEW ORLEANS—Rudolph Ramelli, Inc. (P)
NEW ORLEANS—Southern Solvents and Chemicals (C M P T)

MAINE

LEWISTON—Polar Chemical Company (C M P T)
MARYLAND

BALTIMORE—B. J. Howard Company (C M P T)
BALTIMORE—Leidy Chemicals Corporation (C M P)

LETTER KEYS: C—Chloroethene (K); M—Methylene Chloride; P—Perchloroethylene; T—Trichloroethylene

BALTIMORE—Seiler Chemicals (C)

BALTIMORE—Tilley Chemical Company (T)

MASSACHUSETTS

BOSTON—Howe and French, Inc. (C M)

BOSTON—Linder and Company, Inc. (C M P T)

BOSTON—McKesson and Robbins, Inc. (C M P T)

EVERETT—Dow and Ingalls, Inc. (M P)

FRAMINGHAM—Axtom-Cross Corp. of Mass. (C P T)

HINGHAM—Stephens & Roger, Inc. (C M P T)

HOLYOKE—Eastern Chemicals, Inc. (M)

SPRINGFIELD—Chemical Corporation (C M P T)

SPRINGFIELD—Hampden Color and Chemical Co. (C M P)

WORCESTER—George H. Clark and Co. (C M P T)

MICHIGAN

DETROIT—Eaton Chemical and Dyestuff (C M)

DETROIT—J. Levin Sons, Inc. (T)

DETROIT—McKesson and Robbins, Inc. (C M P T)

DETROIT—Western Solvents and Chemicals (C M P)

DETROIT—Whitfield Chemical Company (P)

EAST DETROIT—Sherwood Chemical Company (P)

ESCANABA—Haviland Products Company (C M P)

FERNDALE—Monroe Corporation (C M P T)

GRAND RAPIDS—P. B. Gast and Sons Company (C)

GRAND RAPIDS—Haviland Products Company (C M)

GRAND RAPIDS—Wolverine Solvents and Chemicals Co. (C M P)

LANSING—Carrier Stephen Company (C P)

LANSING—Wheaton Chemical Company (C P T)

LUDINGTON—P. B. Gast and Sons Company (C)

MINNESOTA

MINNEAPOLIS—W. H. Barber Company (C P T)

MINNEAPOLIS—Merchants Chemical Company (C M P T)

MINNEAPOLIS—Tripoli Refining Corporation (C M P T)

ST. PAUL—Lyons Chemicals, Inc. (C M P T)

MISSISSIPPI

JACKSON—F. H. Ross and Company (C M P)

MISSOURI

KANSAS CITY—Baroda and Page, Inc. (C M)

KANSAS CITY—Missouri Solvents and Chemicals (C M P T)

KANSAS CITY—Sherwood and Company, Inc. (C M P T)

ST. LOUIS—Baroda and Page, Inc. (C M)

ST. LOUIS—Independent Oil Company (C M P T)

ST. LOUIS—McKesson and Robbins, Inc. (C M P T)

ST. LOUIS—G. S. Robins and Company (C M P T)

ST. LOUIS—St. Louis Solvents and Chemicals (C P T)

ST. LOUIS—Missouri Solvents and Chemicals (C P T)

NEBRASKA

OMAHA—McKesson and Robbins, Inc. (C M P T)

OMAHA—Merchandise Chemical Company (C M P T)

OMAHA—Miller Chemical Company (M P)

NEW JERSEY

CAMDEN—Callahan Chemical Company (M P T)

DELAWARE—Delarich Corporation (T)

EAST PATERNOSTER—Aetna Color and Chemical Company (C M P T)

MURRAY HILL—American Mineral Spirits (C M P T)

NEWARK—American Oil and Supply (C P)

NEWARK—Loftie Chemical Company, Inc. (P)

NEWARK—National Oil and Supply Company (C M P T)

PALISADE PARK—Philip A. Hunt Company (C)

PATERSON—A. H. Mathieu Company (P)

RIDGEFIELD—Joseph Turner and Company (P T)

SEAWN—Chemical Producers (C)

VINELAND—Lirio Chemical Company (C T)

NEW MEXICO

ALBUQUERQUE—Braun Chemical Company (C M P T)

ALBUQUERQUE—Edmunds Chemical Company (C M P T)

NEW YORK

ALBANY—Kracker and Campbell (M)

ATHENS—Spick Products Company (P T)

BINGHAMTON—Collier Chem. (C M)

BRONX—Eco Solvents Corporation (M P T)

BROOKLYN—Joseph I. Blank (P)

BROOKLYN—Enequist Chemical Company (C P)

BUFFALO—Buffalo Solvents and Chemicals (C M P)

BUFFALO—Chemical Sales Corporation (C M P)

EDGEMERE—Hogen Industrial Supply (P T)

GLOVERSVILLE—Eastern Chemicals, S. H. Ireland Div. (C M)

LONG ISLAND CITY—Peerless Oil and Chemical (C M P T)

NEW YORK—American Chemicals, Inc. (C M P T)

NEW YORK—City Chemical Corporation (P)

NEW YORK—Fahey and Besthoff, Inc. (P)

NEW YORK—McKesson and Robbins, Inc. (C M P T)

NEW YORK—Merchandise Chemical Company (C M P T)

POUGHKEEPSIE—Duse Chemical Company (C)

RENSSELAER—Eastern Chemicals, Inc. (C M)

ROCHESTER—Chemical Sales Corporation (P)

ROCHESTER—J. H. Roe Oil Company, Inc. (P T)

SYRACUSE—Eastern Chemicals, Inc. (C M)

UTICA—Monarch Laboratories (C M P)

ORTH

CHARLOTTE—F. H. Ross and Company, Inc. (C M P T)

CHARLOTTE—Southern States Chemical Co. (C M P T)

DURHAM—Cardinal Products, Inc. (C P T)

GREENSBORO—F. H. Ross and Company, Inc. (C M P T)

ROANOKE RAPIDS—Howerton-Gowen Company (T)

OHIO

AKRON—Farley Solvents Company (C M P T)

AKRON—C. P. Hall Company (C P T)

CANTON—Bison Corporation (C P T)

CINCINNATI—Amsco Solvents and Chemicals (C M P)

CINCINNATI—Chipman Supply Company (T)

CINCINNATI—Herbert Chemical Company (P T)

CINCINNATI—Merchandise Chemical Company (C M P T)

CLEVELAND—Baker Distributing Company (P T)

CLEVELAND—Carman Supply Company (T)

CLEVELAND—Man-Gill Chemical Company (C P T)

OHIO

CLEVELAND—McKesson and Robbins, Inc. (C M P T)

CLEVELAND—National Solvents Corporation (C P T)

CLEVELAND—R. W. Renton Company (C P T)

DAYTON—Industrial Chemical Products Co. (C P T)

DAYTON—Otto Solvents, Inc. (T)

LIMA—Thomson Chemical Company (C P T)

TOLEDO—Inland Chemical Co. (C M P T)

TOLEDO—Toledo Solvents and Chemicals (C M P)

TOLEDO—Louis Wasserstrom Company (P)

TOLEDO—M. I. Wilcox Company (C P T)

YOUNGSTOWN—Riel Supply Company (C M P T)

OKLAHOMA

OKLAHOMA CITY—Baroda and Page, Inc. (C M)

TULSA—Baroda and Page, Inc. (C M)

TULSA—Chemical Products, Inc. (C M P T)

OREGON

PORTLAND—Van Waters and Rogers (C M P)

PENNSYLVANIA

CONSHOHOCKEN—American Mineral Spirits (C M P T)

EASTON—Lehigh Valley Chemical Company (C M P T)

MCKEE ROCK—Apex Soap and Sanitary Corp. (C P T)

PHILADELPHIA—Alex C. Ferguson Company (C P T)

PHILADELPHIA—McKesson and Robbins, Inc. (C M P T)

PHILADELPHIA—Merchandise Product Company (C M P)

PHILADELPHIA—Phillips and Jacobs, Inc. (C M)

PHILADELPHIA—Pioneer Salt Company (C M P T)

PHILADELPHIA—George Senn, Inc. (C M P T)

PITTSBURGH—Carmac Chemical Company, Inc. (C P)

PITTSBURGH—Carman-Pittsburgh Company (C P T)

PITTSBURGH—F. Pitt Chemical Company (C M P T)

PITTSBURGH—McKesson and Robbins, Inc. (C M P T)

READING—W. Eaken, Inc. (C P T)

READING—Textile Chemical Company (C P T)

SCRANTON—Scranton Chemical Company (C P T)

YORK—Industrial Solvents and Chemicals (C P T)

RHODE ISLAND

PROVIDENCE—George Mann and Company (C M P T)

PROVIDENCE—Sessions-Gifford Company, Inc. (C P T)

SOUTH CAROLINA

CHARLESTON—Burris Chemical Company (C P T)

GREENVILLE—Southern States Chemical Company (C M P T)

SPARTANBURG—Moreland Chemical Company, Inc. (C M P T)

TENNESSEE

CHATTANOOGA—Chapman Chemical Co. (C M P T)

CHATTANOOGA—Southern Products Company, Inc. (P)

CHATTANOOGA—Wilson Sales Company (C M P T)

KINGSPORT—Chem-I-Dent, Inc. (C P T)

MEMPHIS—Chapman Chemical Company (C M P T)

MEMPHIS—C. P. Hall Company (C M P T)

MEMPHIS—Ideal Chemical and Supply Co. (C M P T)

NASHVILLE—Chapman Chemical Company (C M P T)

NASHVILLE—Post Brokerage Company (P)

NASHVILLE—Wilson Sales Company (C M P T)

TEXAS

AMARILLO—State Chemical Company (C M P T)

AUSTIN—R. M. Hughes Company, Inc. (C M P T)

BAUMONT—Arthur Dooley and Son (C M P T)

CORPUS CHRISTI—Baroda and Page, Inc. (C M)

DALLAS—Baroda and Page, Inc. (C M)

DALLAS—Texas Solvents and Chemicals Co. (C M P T)

DALLAS—Van Waters and Rogers, Inc. (C P T)

EL PASO—Baron Chemical Company (C M P T)

EL PASO—Baron Chemical Company (C M P T)

FORT WORTH—Baroda and Page, Inc. (C M)

FORT WORTH—Worth Chemical Products Co. (C M P T)

HOUSTON—Baroda and Page, Inc. (C M)

HOUSTON—W. H. Curtin and Company (P)

HOUSTON—Dixie Chemical Company (C M P T)

HOUSTON—Houston Oil Field Mkt. (P)

HOUSTON—R. M. Hughes Company, Inc. (C M P T)

HOUSTON—McKesson, Texas Chemical Division (C M P T)

HOUSTON—Peebles-Gaulbert Corporation (C)

HOUSTON—Texas Solvents and Chemicals Co. (C M P T)

HOUSTON—Van Waters and Rogers, Inc. (C P T)

LUBBOCK—State Chemical Company (C M P T)

MIDLAND—State Chemical Company (C M P T)

ODESSA—Baroda and Page, Inc. (C M)

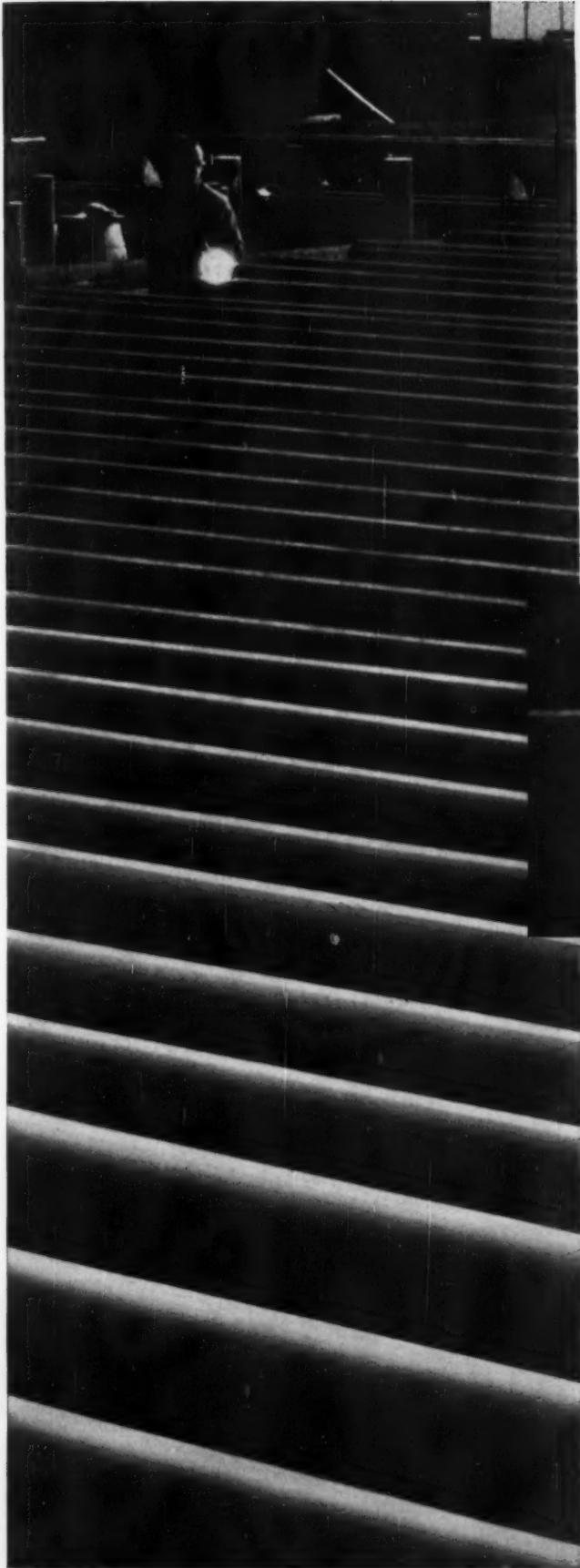
SAN ANTONIO—R. M. Hughes Company, Inc. (C M P T)

SAN ANTONIO—McKesson and Robbins, Inc. (C M P T)

SAN ANTONIO—Peebles-Gaulbert Corporation (C)

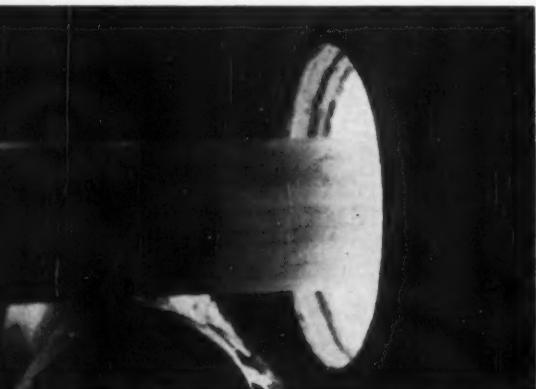
UTAH

SALT LAKE CITY—Braun-Knecht-Heimann Co. (C M P)



**"GAS gives us
the controllability,
cleanliness, economy
and speed we demand"**

A. O. Smith Corporation



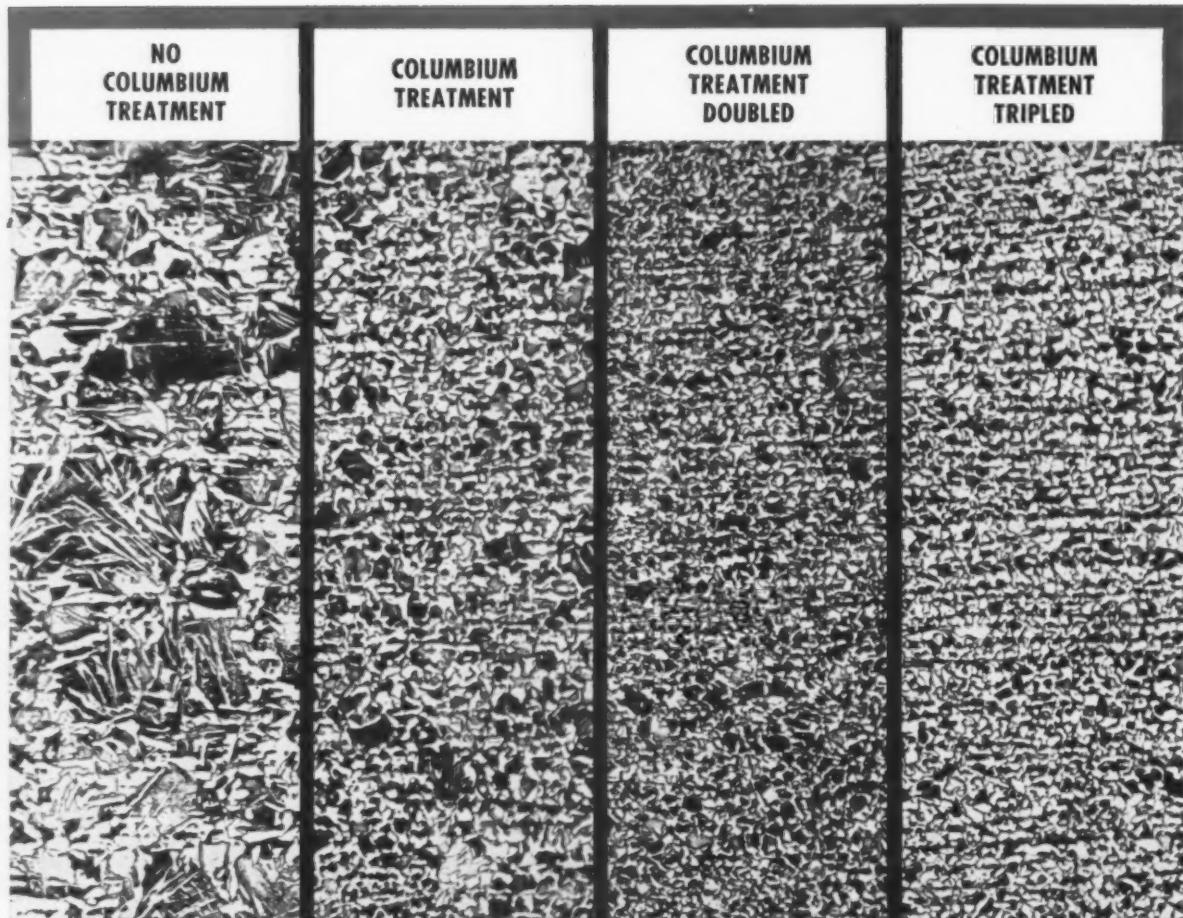
Lengths of oil well casing are in production at the A. O. Smith Corporation in Milwaukee. They are being stress relieved in a gas furnace.

Gas has proved best on A. O. Smith's production line because of its cleanliness, controllability, speed and economy. Gas gives nearly 50% reduction in cost over their previous fuel, and carbon spots have been eliminated. There are three pre-heat furnaces that heat the pipe to 1650°-1750°, depending on the size of pipe. Three re-heat furnaces bring the temperature back up before quenching.

A. O. Smith also produces auto frames, pressure vessels, glass lined farm storage units and tanks, glass-lined gas water heaters and furnaces. Throughout their operations, gas is installed as an integral, indispensable part of their production lines.

For information on how gas can help you in your production operations, call your gas company's industrial specialist. He'll be glad to discuss the economies and superior results you get with modern gas industrial equipment. *American Gas Association.*

HOW GREAT LAKES



Composite of photomicrographs made from the same heat of mild carbon steel shows the effect of varying columbium treatments on the grain structure of the steel.

The Great Lakes Family of High-Strength Steels



Lets you design superior performance, longer life and less weight into your product. Many diversified applications.



Offers all the characteristic features of N-A-X Finegrain, plus greatly enhanced resistance to atmospheric corrosion.



A series of fine grained, mild carbon steels. They have unusually high strength, toughness and weldability.



Quenched and tempered steels of excellent weldability and toughness, with yield strengths from 75,000 - 110,000 psi.



N-A-X High Manganese and High Manganese Special Killed. These steels give yield strengths up to 50,000 psi.

STEEL CORPORATION'S NEW GLX-W STEELS GIVE ... HIGH STRENGTH TOUGHNESS REDUCED COSTS

Key to the success of Great Lakes' new GLX-W Series of steels is the fine grained internal structure produced by treatment with columbium. This grain refinement also contributes to ductility. And in addition, the GLX-W Series' low carbon and manganese content assures excellent weldability with freedom from underbead cracking under all conditions.

COST AND WEIGHT SAVINGS

Where design permits the replacement of carbon steel with GLX-W steels, weight savings of 20 to 35 per cent, and cost savings of 10 to 25 per cent can be realized. When replacing alloy steels the cost savings can range from 25 to 35 per cent. These steels feature higher yield strengths, greater tensile strengths and increased toughness without costly heat treatments or extensive alloy additions.

The GLX-W Series is so priced that substantial cost reductions can be obtained by weight reduction over mild carbon steel. Cost reduction can also be obtained over alloy steels because of the lower price of GLX-W steels.

STRONGER AND TOUGHER

GLX-W steels are stronger and tougher than ordinary mild carbon steels and in some applications can do the job now being done by the more costly alloy steels.

MANY USES FOR GLX-W STEELS

GLX-W steels are especially recommended for a broad range of applications in mobile equipment and pressure vessels, as well as the transportation and construction fields.



For additional technical information about these economical GLX-W steels write

Product Development Division, Dept. A-1

GREAT LAKES STEEL CORPORATION
Detroit 29, Michigan • Division of

NATIONAL STEEL CORPORATION



New "Comapro" project cuts machining time up to 30%...

GULF MAKES THINGS

Only five months under way, the Cooperative Machining Project known as "Comapro" has already developed unusual time-saving and cost-cutting machining practices, using Gulfcut Cutting Oils.

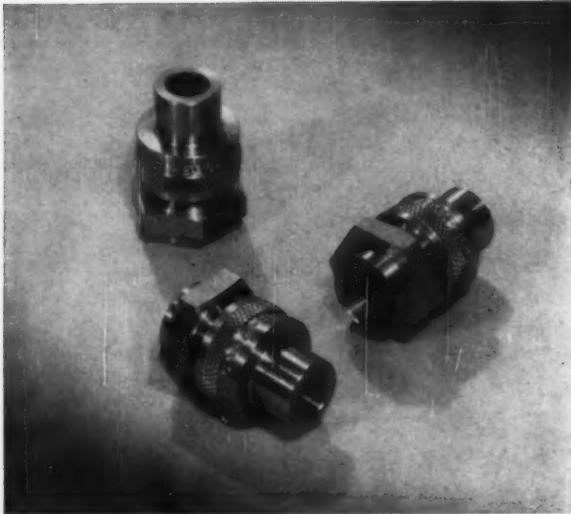
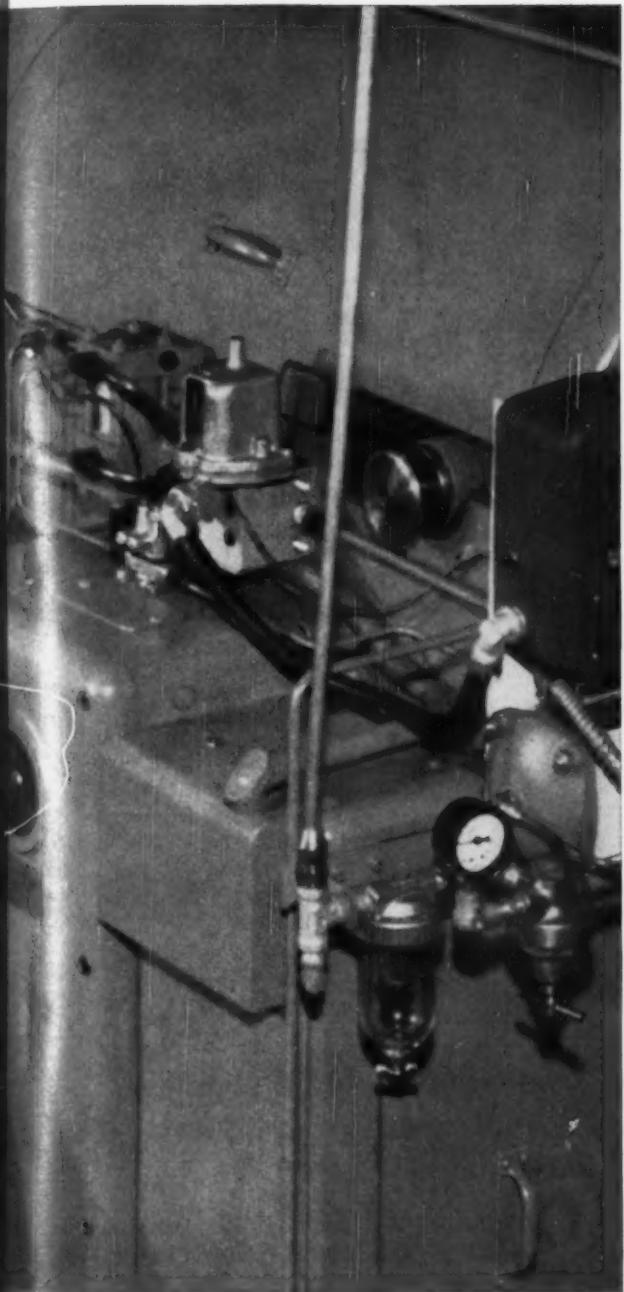
A case in point is the machining of a simulated spark plug shell at the COMAPRO Department of one of the participating manufacturers—Cone Automatic Machine Company, Windsor, Vermont.

Using Gulfcut Cutting Oil in a Conomatic bar ma-

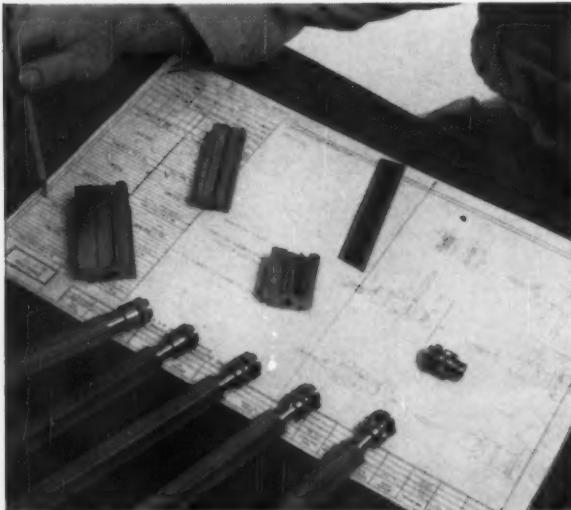
chine, they're running this spark plug part in 4.4 seconds, compared to an industry average of 6 seconds. A 30% saving in machining time!

This is right in line with the over-all objective of "Comapro"—to develop more efficient ways to cut the cost-per-part figures in a wide variety of machining jobs, particularly in mass production. Findings will be made available to the entire metalworking industry.

As a co-sponsor of "Comapro," Gulf supplies all the



Lower cost per piece—on a great variety of machined parts—is the main goal of the "Comapro" cooperative cost-research program. For complete information on the latest findings of the project, write to COMAPRO, c/o Cone Automatic Machine Company, Windsor, Vermont.



◀ This Conomatic automatic bar machine is a pilot unit in the "Comapro" research project. Gulfcut Heavy Duty Soluble Oil helps it operate at maximum output, to determine best machining practice at lowest cost per part.

and proves again **RUN BETTER!**

cutting oils for the project, from the complete Gulfcut line—plus Gulf greases and machine lubricants. Under closely controlled research conditions, the proof is piling up that Gulf makes things run better!

Let us help you put "Comapro" findings to work in *your* production—and show you how Gulf makes things run better in your plant, operation-wise and cost-wise. For complete information, call a Gulf Sales Engineer at the nearest Gulf office.

THE IRON AGE, January 29, 1959

GULF OIL CORPORATION

Dept. DM, Gulf Building
Pittsburgh 30, Pennsylvania



NEW FROM FAIR STREET • HOME OF THE JIGMIL

mic
the first grinder



**"Micropoint is the first
machine in its field
able to grind tool
profiles geometrically
correct to gage
room accuracy"**

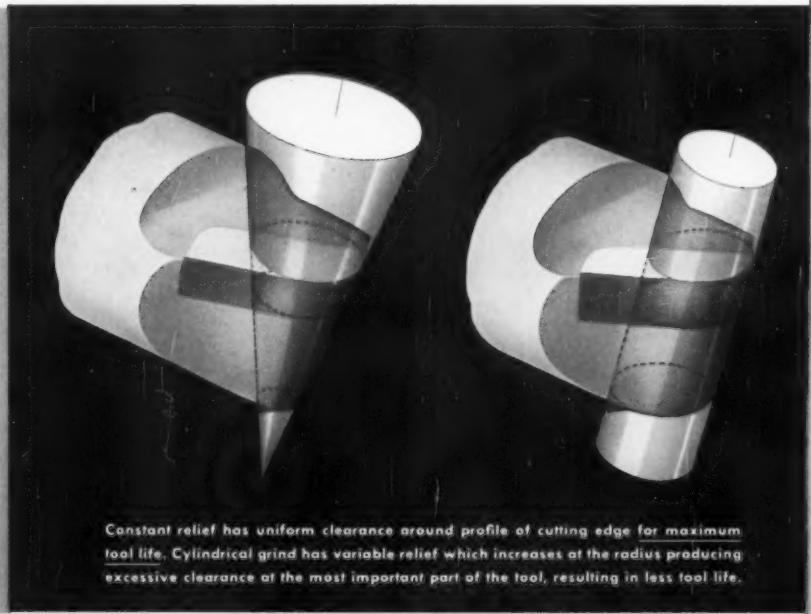
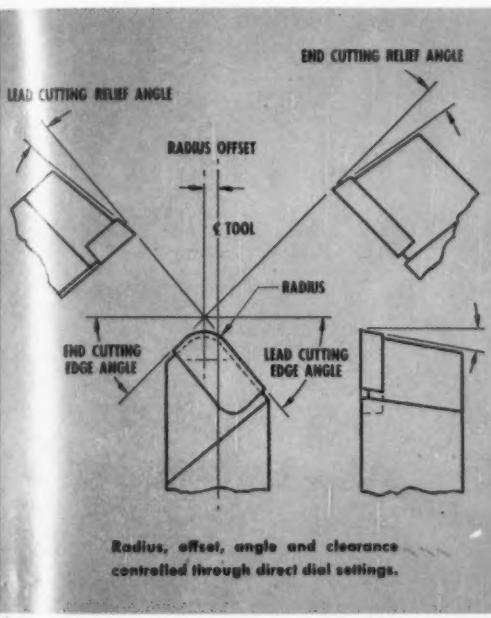
"MICROPOINT is not just another grinder. It's a precision machine that makes possible a new technique of single point tool grinding. Advantages of this new technique include greater cutting tool life, increased accuracy and output of machine tools and greatly improved uniformity and finish of the end product. Originally developed for our own use, MICROPOINT became necessary in our continuing pursuit of accuracy."

C. B. DE VLIEG

DE VLIEG MACHINE COMPANY, FAIR STREET • ROYAL OAK, MICHIGAN

cropoint®

capable of absolute control of tool geometry



DIRECT DIAL SETTINGS reduce the possibility of human error and provide a method of fast, simple, accurate adjustment for each radius, angle, offset and clearance in exact accordance with the geometric requirements of the tool. With a minimum of operator training, tool profiles can be controlled to .0001". Set-ups can be made quickly and with precise accuracy. Operators have ground as many as 300 identical tools in one set-up without corrective adjustment. Because of the machine's unique design, diamond wheel cutting life has been increased 4 to 6 times. Field tested for three years, many MICROPOINT grinders are already in use throughout industry. Available from your DeVlieg distributor.



Write for Micropoint
Tool Grinder Catalog

REWARDING REVELATIONS IN PRECISION
AWAIT YOUR VISIT TO FAIR STREET



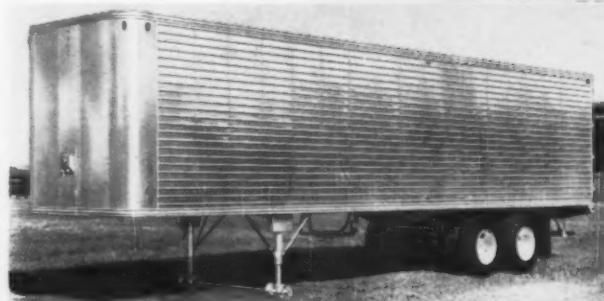
DeVlieg
MICROPOINT®
TOOL GRINDER

Geometrically correct tool points ground to gage room accuracy!

When aluminum
is part of your
product . . .



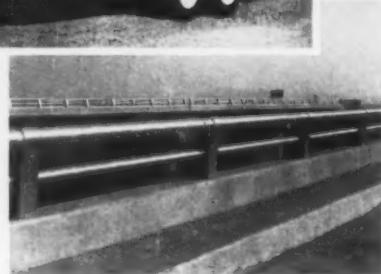
Appliances



Transportation Equipment



Building Materials



Bridge Railing

check with Anaconda Aluminum

If your product demands aluminum to exact specifications—and you're not getting it—call on Anaconda!

Custom production, combining precision control of the most modern equipment available with the craftsmanship of aluminum experts, assures you that Anaconda Aluminum always matches your product specifications precisely. And the flexibility of our

modern plant facilities gives your orders fast action, prompt shipment.

Talk over your requirements for pig and ingot, coiled and flat sheet, extruded shapes, structurals, rod, bar and tubular products now with your local Anaconda Aluminum representative . . . or write our General Offices, Dept. A-1, Louisville 1, Kentucky.

Remember...

**EVERY INDUSTRY HAS ONE MEMBER
WHO SPECIALIZES IN CUSTOMER SATISFACTION**



ANACONDA ALUMINUM COMPANY • GENERAL OFFICES, LOUISVILLE, KENTUCKY



12 B&W IFB lined single stack annealing covers in use in the strip annealing department of Weirton Steel Company, a division of National Steel Corporation, at Weirton, West Virginia.

uses lightweight B&W Insulating Firebrick for single stack annealing covers.

These 12 covers, lined with B&W K-20 Insulating Firebrick, have been in service more than two years in the annealing of low and high carbon strip from Weirton's 54" strip mill. Identical in construction, the covers are over 17 feet from base to skew and over 10 feet in diameter. The domes are of 9" K-20 IFB construction.

The K-20 is one of B&W's *lightweight* Insulating Firebrick. In fact, B&W K-20 IFB are at least a third of a

pound lighter than other 2000 F insulating firebrick. This means savings in the overall weight of portable covers. Additional savings in fuel consumption and cycle time are possible because lightweight B&W IFB store and conduct less heat. Heat is kept in the furnace, not in the lining.

This application points out advantages of light weight in insulating firebrick constructions. And B&W makes the *lightest* weight insulating

firebrick. Consult your B&W Refractories Representative for information on how you can profit with lightweight B&W IFB.

Bulletin R-2-H available on request.

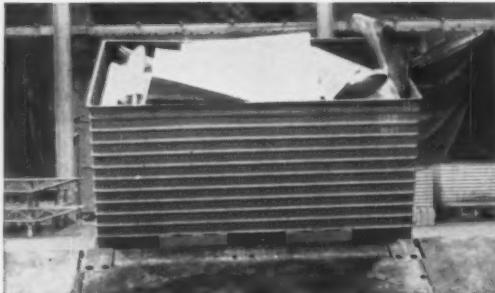
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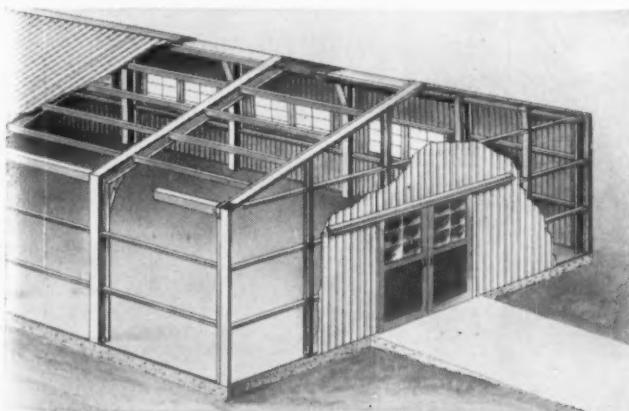
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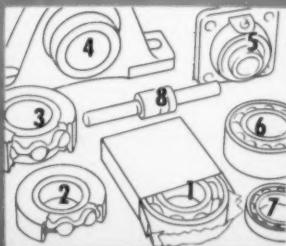
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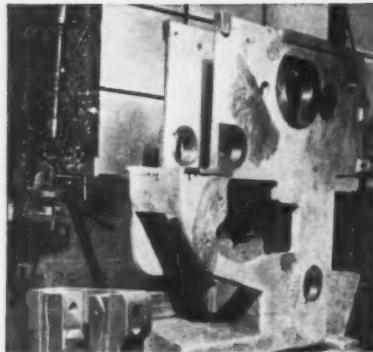
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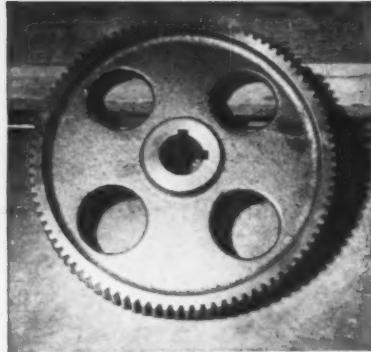
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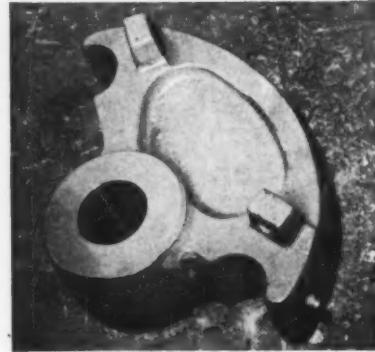
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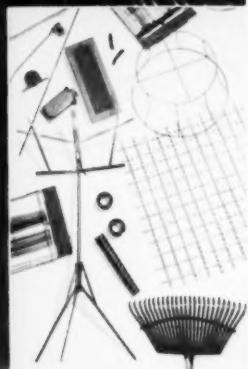
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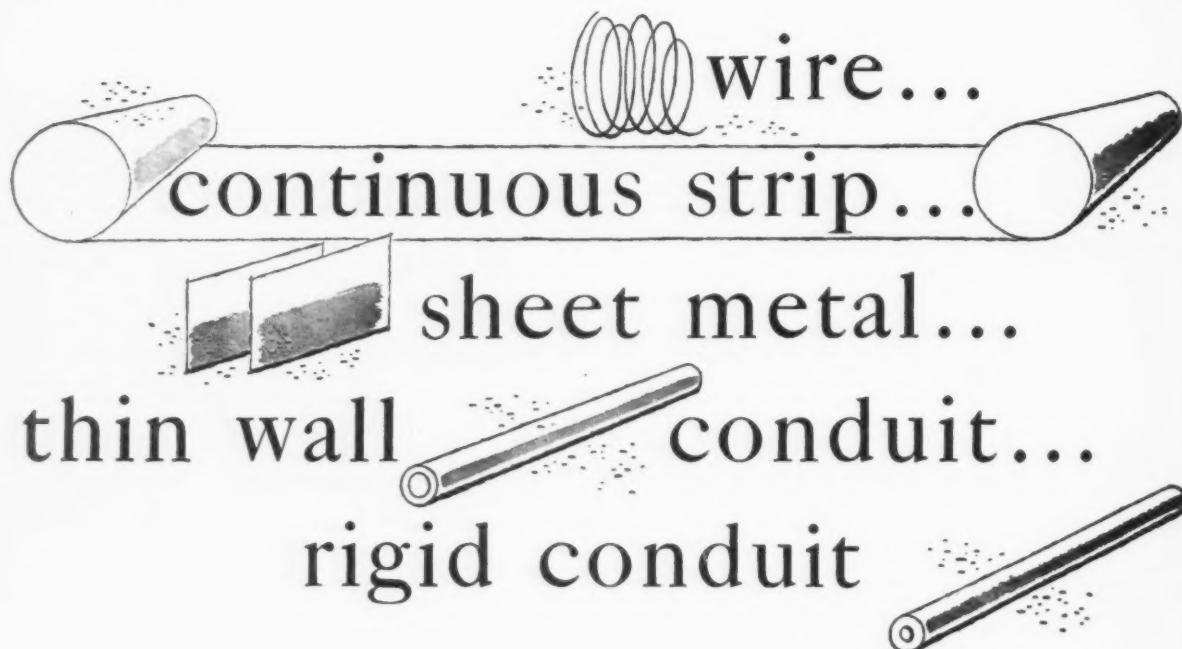
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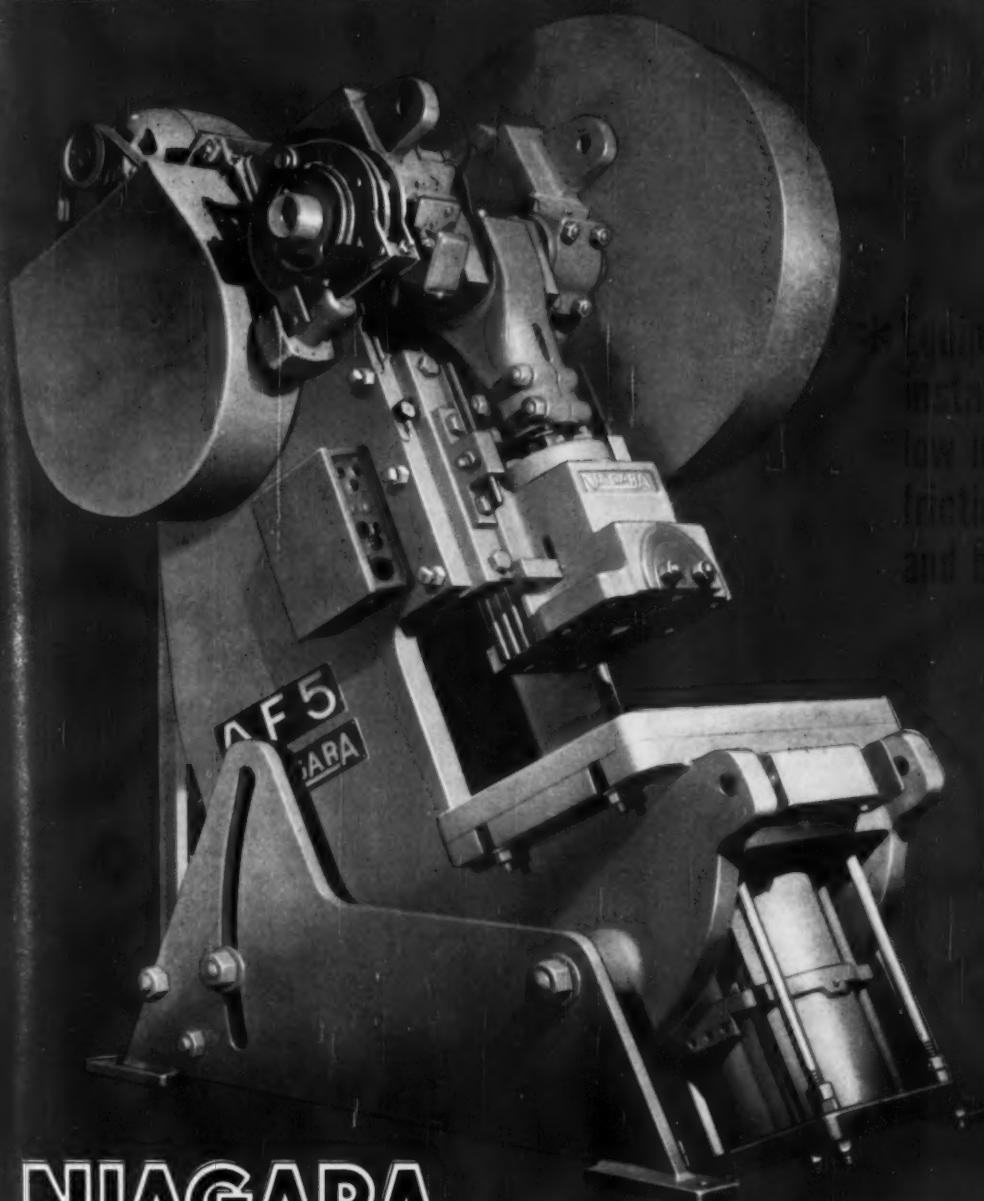


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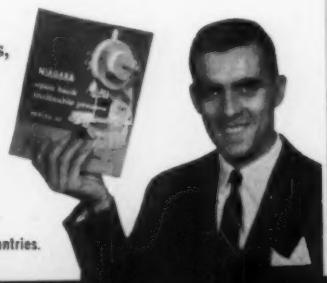
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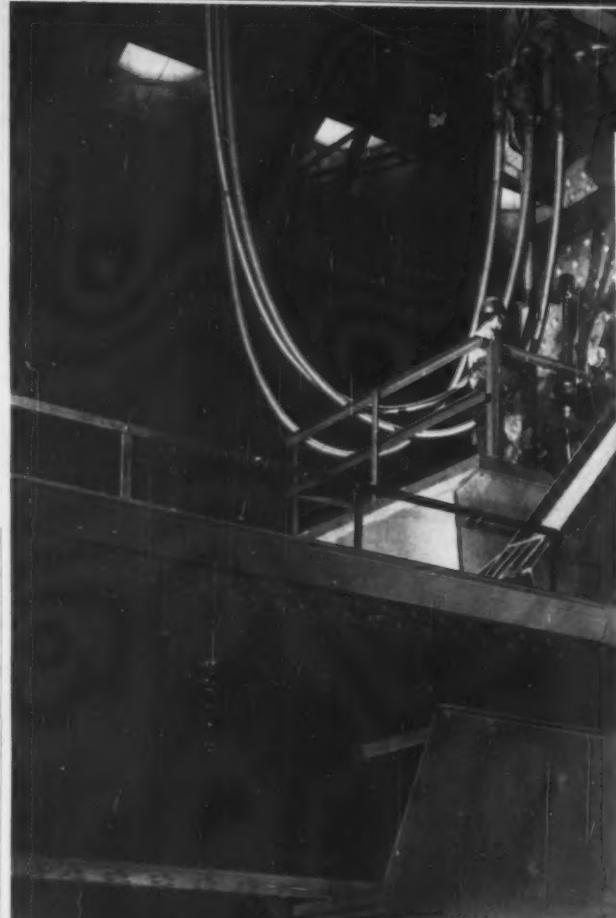
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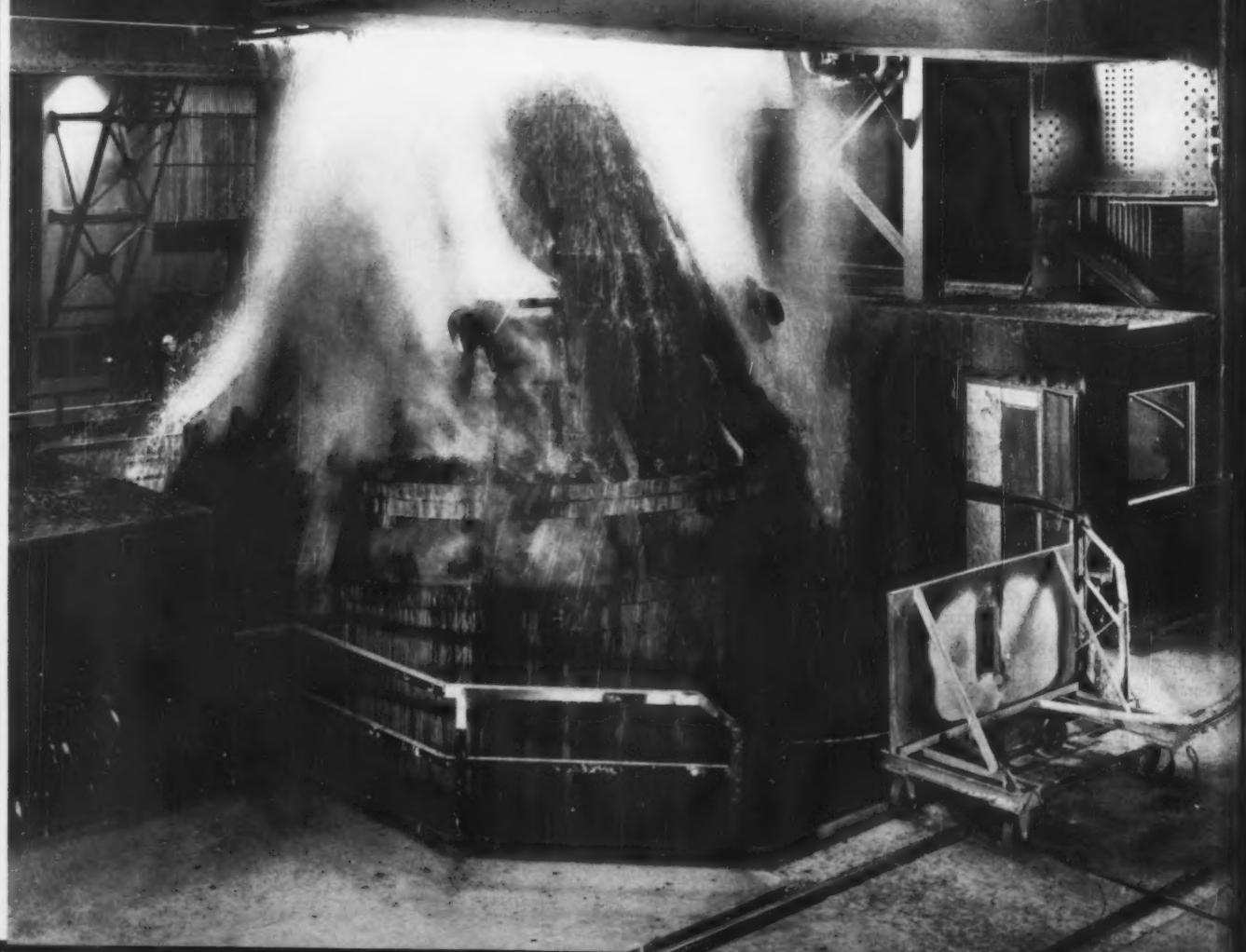
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MARKET-PLANNING DIGEST

STEEL STRIKE HEDGE-BUYING is turning into a stampede. Some users are playing both ends against the middle. They're placing orders now for delivery in the critical second quarter. At the same time they're taking in steel in first quarter. At this rate it won't be long before the steel market is tight as a drum for the entire first half.

ALUMINUM IN HOUSING is being tagged as the industry's No. 1 market for the immediate future. One aluminum mill already has hired a full-time "residential" aluminum sales force. Alcoa, Reynolds, and Kaiser are promoting the market for all it's worth.

COPPER USERS FACE PROBLEMS in 1959. If everything goes well, there will be plenty of copper for everybody. But important labor contracts are up for renewal this year. And this and other factors could upset the applecart.

MOVING SOLIDS BY PIPELINE? That's not so preposterous as it might have seemed several years ago. Coal already is being moved between Cadiz, O., and Lake Erie by pipe. Its success raises the possibility that other solids will be moved the same way.

PLANNING FOR A RISING MARKET is a complex problem. Practically every industry is faced with it. Westinghouse Electric Corp.'s appliance division has developed a step-by-step system that is put into force when the market forecast is "up".

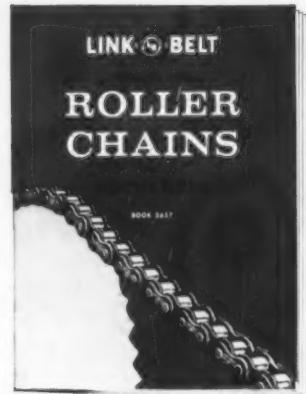
USE OF STAINLESS STEEL IN AUTOS is up about 15 pct over last year. Indications are that each '59 model will use 42.6 lb of stainless. This compares with 37.2 lb in 1958 and 36 lb in 1957.

INDUSTRIAL CONSTRUCTION is trending up. This is the consensus of builders who specialize in the industrial field. "There has been a pickup in sales activity in both the talking and the contract-signing stages in the last several months," says Carl B. Whyte, outgoing president of the National Constructors Assn.

HOME HEATING BY ELECTRICITY is growing, says Allegheny Ludlum Steel Corp. It says power companies are now courting builders and owners, whereas they previously shied away from electrical home heating. The reason is that growth of summer air-conditioning makes summer the peak period for electricity use. The power firms want to level out the load.

MACHINE TOOL BUILDERS think January will determine whether their market is really coming back. December orders of \$43 million represented the best month of anything-but-prosperous '58. But the builders are not uncrossing their fingers until they see whether the uptrend is continuing. New orders in '58 totaled \$375 million, worst year since '49.

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Steel Buyers Get Strike Fever: Hedge Buying Begins

June is still a long way off, but steel users are starting to run scared.

A delivery logjam will probably hit the market in March.

■ The rush to build steel inventories is underway.

Buying fever is running high among steel users who have become convinced that a long and bitter steel strike next summer is a certainty.

Purchasing agents, playing both ends against the middle, are booking tonnages as far in advance as June and are working backwards

through May and April. The lash-up in steel deliveries should start in March as current orders run headlong into advance bookings.

It's Spreading—In the Chicago district, mills have been allocating plates and cold-rolled sheets for several weeks. Now the buildup is spreading to Pittsburgh.

"Orders are just swamping us," reports a major Pittsburgh mill. "The outlook is for plates, wide flange beams, and all flat-rolled products to be booked to capacity." Orders for oil country seamless are coming through at a rate that points to capacity operations by March.

May Be Too Late—The situation in Pittsburgh indicates a nationwide trend is in the making. Up to this point, Pittsburgh had been lagging behind Chicago for several reasons. Pittsburgh is not a big steel consuming area, and it lies some distance from Detroit and other major consuming centers.

With strike-hedge ordering beginning to build up in mill order books, it may be too late for many buyers to get enough steel in their bays to last through a moderately-long steel strike.

Even if the mills operated at capacity from now until strike deadline, which they won't, overall in-

Steel Buyers on Labor and Price Outlook

"I think there's going to be a helluva strike. Starting in March, we're going to build inventory to cover July and August."—Auto body builder.

"One of our objectives is to build inventories to a point where it will take pressure off mills for a quick settlement on labor's terms. We hope other companies will do the same."—Appliance maker.

"They'll probably raise the price \$5 to \$10. But it doesn't matter what they raise the price of steel per ton. Nobody pays much attention to the extras when they go up and that's where you get murdered."—Bearings producer.

"We're not going to be panicked into wild buying. We were caught with a topheavy surplus at the start of 1958 and have been liquidating inventory ever since. We shudder to think of getting into the same thing again."—A major oil company.

"We are protecting ourselves. We started several months ago to build steel inventory. We feel we are not taking too much of a risk in view of the chances of wage and price increases."—Electrical equipment producer.

"Steel prices will go up, but not as much as everyone is talking about. The steel companies can't afford to push prices up too much or they'll have Congress back on their necks."—An independent auto producer.

"We plan to get in an added 60-90 days' supply. You can't go further than that. After two months of steel strike, everything stops."—Steel mill equipment maker.

"We're figuring on a maximum 12 weeks strike and are stocking in enough steel to taking care of our carbuilding program through September."—Railroad.

ventory buildup will not be enough to constitute a real hedge.

Barely Keeping Pace—Consumption of steel is now running about six million tons a month. The general recovery and seasonal influences are due to boost consumption to 6.5 million tons a month by the summer.

The most industry can add to steel stocks between now and the end of June, say steel analysts, is about six million tons. Even without any question of a strike, the June inventory level will not be excessive.

Some Will Miss Out—But automotive, appliance, and other large companies will probably be able to build strike cushions. For small companies, it won't be so easy.

Within the last few weeks, the auto companies have sent word to their suppliers: Get enough steel on hand to last through the '59 model season.

"We're moving to protect ourselves against a possible steel strike," says Ford Motor Com-

pany's Harold Compson, raw materials buyer. "We've sent letters to our suppliers authorizing them to acquire enough steel to see them through the balance of the 1959 model year and the start-up of 1960 model production."

Suppliers Get Backing—To make sure stampers get in enough steel to last through any strike period, the auto concerns are reported backing them up on purchases. Where suppliers are not anxious to stock up, they are guaranteed they won't be stuck with any steel.

Westinghouse Electric Corp. started building its inventory several months ago. As to the extent of the buildup, A. M. Kennedy, Jr., vice president, purchasing and traffic, indicated that Westinghouse would still be in good shape after a two-month strike.

Easing the Pressure—"We feel we are not taking too much of a risk in view of the chances of wage and price increases," Mr. Kennedy says.

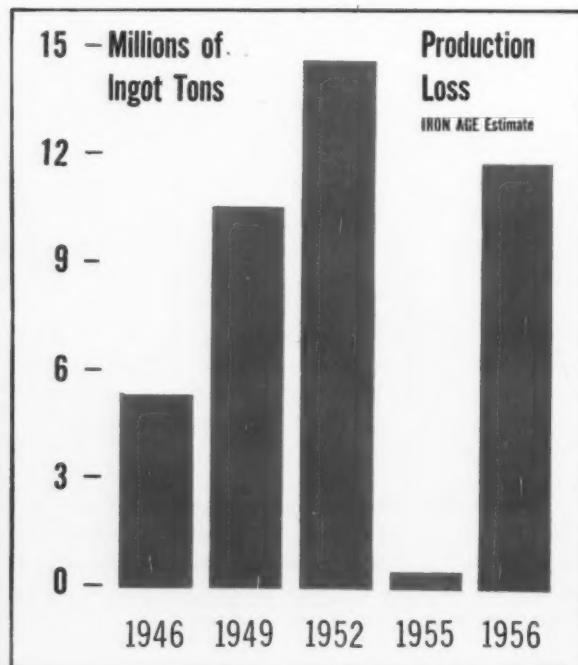
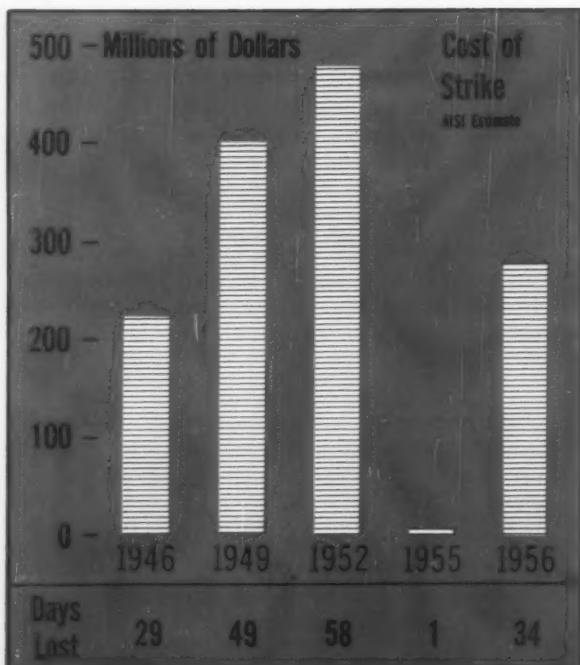
One objective of the Westinghouse buildup has been to put the company in shape where its supply situation would not bring pressure on the mills for a quick settlement on labor's terms—in event of a strike. Many other companies, especially larger ones, feel the same way.

Say the buyer for a large eastern railroad: "What we and other companies can do to help the mills get a favorable settlement is to buy enough steel to last through a strike."

Service Centers Help—Weakest link in inventory buying appears to be the smaller companies who are trapped between tying up cash in steel stocks and the prospect of running out of steel if they don't buy. Many of these companies are relying on steel service centers to carry them through a strike period.

Of those who are holding down inventory, reasons given include poor business, inability to stand extra handling and storage costs, and requirements so specialized that

How Steel Fared in Other Strike Years



stockbuilding is impractical.

PA's Polled—Of 31 purchasing agents for major steel consumers polled by The IRON AGE, all but three believe that a steel strike is sure to come. Consensus is it will last between four and 12 weeks.

There is practically no doubt among the purchasing agents that higher prices will come on the heels of a new steel labor contract. Their estimates vary from \$4 to \$10 a ton.

Extras Hike Unlikely—“If steel companies are forced to grant economic benefits, it seems inevitable they'll pass at least part of it along to their customers,” says the PA for an automotive parts supplier.

An extras increase in late February or early March is regarded by some as an outside possibility. But most believe steel companies will avoid any pre-strike increases in extras because (1) it might not be good from a public opinion standpoint and (2) steel is already in danger of losing business to foreign steel importers if prices continue upward.

How Imports Figure—In the event of a long strike, the influx of foreign steel could help take pressure off the mills to settle on labor's terms. But some quality steel buyers say otherwise.

“We tried importing German and French steel during the Korean war and it didn't amount to a damn,” exclaimed the buyer for a large auto partsmaker. He said he won't try it again.

Tinplate Users Prudent—One class of steel consumer which will fare better than others is the tinplate users.

Tinplate customers started strike hedge buying as early as last October. On top of the rush to beat the November price rise, many substantially increased orders for the first half of 1959. Storage space outside mills is being lined up now with their orders.

Canmakers had learned the hard way. They were badly burned by

What Service Centers Expect

Steel service centers are no more optimistic than their customers over the prospects of a peaceful steel labor settlement.

In contrast to last year when inventories were cut about 10 pct, the nation's steel warehouses have now begun to rebuild stocks. They want to be in a position to help their customers weather a possible strike.

At the moment, service center inventories are estimated at 3.4 million tons, with virtually no items in short supply.

the 58-day strike of 1952. Many paid thousands of dollars premium for conversion steel, imports, and extra freight for emergency shipments.

U. S. Intervention Unwanted—Most purchasing men feel that the government shouldn't intervene in a steel strike. Typical reaction: “The further the federal government stays from business, the better it will be.”

Mr. Kennedy of Westinghouse says he hopes “the Government hand will not be laid on the scale in favor of labor.”

“I think the nub of the question is how long it will take the Democratic Congress to marshall its forces,” he adds.

The Breaking Point—Few expect the Administration to enter the strike picture unless the strike should run over 45 days. Pressure would probably be put on both government and the steel industry by steel users after 30 days, but this pressure is not likely to become sharp until six weeks of strike.

A strike beyond two months is almost unthinkable. Few metalworking companies carry more than two months supply of steel on hand at any time. A strike be-

At the American Steel Warehouse Assn. meeting in New York last week, the consensus was that shipments would be up about 10 pct in first quarter, with a further improvement looked for during the balance of the year.

Robert Welch, ASWA executive vice president, reported that business in Chicago and the Midwest is better than that in the East Coast and the Detroit - Cleveland - Pittsburgh regions. Pacific Coast and Texas are optimistic, mainly because of defense business and farm prosperity.

yond this period would put thousands out of work. Political pressure would mount tremendously to force a settlement.

As it stands now, hedge buying is becoming the order of the day. The immediate problem among steel companies is separating the water from the legitimate orders.

Policing the Books—Mills, wary of advance orders, are studying them closely in regard to the buyer's previous history, tonnage requirements, and order pattern. They would like to cull out duplicate orders that have been placed with several sources by buyers hoping to insure delivery.

One major mill says its rule of thumb is: Any tonnage requests 1½ times the usual order size get a tight screening. Other mills mention concern about “water in the books.”

While the rush to build inventories has started, many users don't want delivery until March or later. Producers, on the other hand, wish users would take delivery now.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Copper Users Face Problems

There's Enough Metal, But They Can Still Get Hurt

Overall, there is no shortage of copper in sight for U. S. fabricators this year.

But there is also no shortage of factors that could upset the market, at least temporarily.
—By F. J. Starin.

■ There seems to be little doubt that the supply of copper in the U. S. this year will be more than enough to meet demand. But the job of the copper purchasing agent will be anything but a bed of roses.

A number of factors will keep

the spectre of fluctuating price, temporary shortages, and tight spots haunting the user through most of the year.

Playing It Safe—Some market observers say there is a fair chance 1959 will pass without a single major copper problem cropping up. There are no loud rebuttals to this in the trade. But few fabricators appear to be operating on this premise. First, the recent history of the industry suggests this is unlikely, and second, just a short 40 winks at the switch at the wrong time could be costly for fabricators in

their highly competitive market.

A marketing man for a producer points out that our not being self sufficient in copper is at the core of the problem. We must import about 300,000 tons a year. This is complicated because, (1) domestic output is not increasing, so any increase in use must be met with foreign metal, (2) while copper output outside the U. S. is rising, consumption outside the U. S. is heading up more sharply, and (3) the main sources of supply outside the U. S. are currently socially and politically sensitive.

Can't Count on Scrap—Another problem: The condition of the secondary industry is hazy. Business, and activity, at refineries using scrap for a raw material seem to be improving. But one ingot maker said last week his industry was off 40 to 60 pct last year, and there have been no solid signs of improvement yet.

Labor is the big question mark. In 1958, without a single major copper company labor contract up for negotiation, about 90,000 tons of copper were lost in the world because of strikes.

Guessing Game—Contracts between the major copper refineries and the biggest union, International Mine, Mill, and Smelter Workers, end at the same time as contracts between the steel companies and the United Steelworkers. Zero hour is midnight, June 30.

Here's the problem for copper buyers: To protect against a copper strike they would have to hedge. If there is a copper strike and no steel strike, hedgers would be in good shape in a rising market.

On the other hand, if there is a steel strike as most experts predict, and no copper strike, copper hedg-

Spot Copper Shortages Ahead?



ers would likely be stuck with backyards full of copper in a falling market. Some of steel's best customers are also big users of copper. If they can't get steel and cut back production, they'll also buy less copper. That is, unless they hedge enough steel to tide them over the strike.

On the Other Hand—If there are no strikes, the strength gained by the market from hedge buying will drain out and likely cause a sag until stocks are worked off. In brief, there are countless combinations buyers must figure the odds on.

The outlook in Chile is pretty good this year. The new president, Jorge Alessandri, is a business man. Also, he came into office on a very small majority, starts his administration with a deficit, in the midst of a raging inflation.

In short, he can't afford a strike, and probably has the equipment to understand the problems and come up with answers.

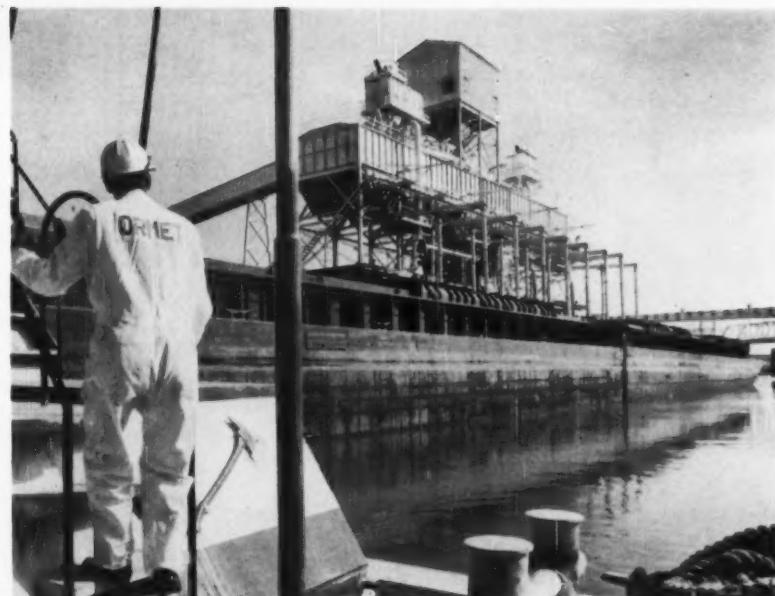
African copper is the largest untapped potential. Tonnages coming to the U. S. are minor because the continent is in the sterling sphere of influence. This is not likely to change this year, but will in the long run.

However, native labor is starting to really organize and wildcat strikes are common.

New for Who?—On the bright side, there will be about 141,000 tons of new mine capacity brought in during the year:

U. S.	10,000 tons
Canada	25,000 tons
Chile	54,000 tons
Nicaragua	4000 tons
Philippines	10,000 tons
N. Rhodesia	20,000 tons
S. Rhodesia	8000 tons
Australia	10,000 tons

The statistics which prompted fabricators to keep stocks low in 1958 no longer point that way. Unsold stocks at U. S. smelters are steadily being depleted.



UP THE RIVER: Barges pull up to this dock to be loaded with alumina they will carry up the Mississippi to Ormet's refinery. The bauxite to make the alumina came into this port from the Caribbean.

New Ore Port

■ The new \$15 million bulk marine terminal at Burnside, La., dedicated last week, means many things to many people.

To Ormet Corp., aluminum producer leasing the ore port, it means a time-and-money-saving unloading setup right next to its new \$55 million alumina plant. Bauxite from the Caribbean can be unloaded, made into alumina, and sent on its way to the upriver refinery with a minimum of handling.

Port Means Business—To the Port of Baton Rouge, which owns the terminal, it is likely to mean more business. The terminal has an 800 ft dock, mooring depth of 40 ft, and can handle the largest ore vessels now in service. It can unload up to 1600 tons per hour per ship or barge, to a maximum of 4800 tons per hour. Its annual capacity is rated at 4 million tons.

This makes the new terminal the

largest for bulk cargo on the Gulf.

On the Agenda—In 1959 such bulk items as bauxite, alumina, coal, iron ore, manganese ore, chrome ore, phosphate, and liquid caustic soda are expected to pass through the terminal. About 2.5 million tons will be handled.

Ormet figures this would make the port one of the top 10 deep water ports in the U. S., and one of the six largest deep water ore ports.

For Sale—Also, Ormet owns about 3000 acres adjacent to the terminal which it says are available for industrial development.

To Up-river industry it means more and cheaper water transportation, particularly for high per-unit cost raw materials. Ormet estimates the new terminal will increase inbound cargo on the deep water section of the Mississippi River by about 40 pct this year.



ON THE LINE: The pace of this Westinghouse appliance line is closely geared to outlook for sales.

How Westinghouse Looks Ahead

Planning production schedules to meet a rising market is a complex operation.

Here's how Westinghouse Electric Corp. handles the situation.—By G. J. McManus.

■ On Friday, Jan. 2, top men in the refrigerator group of Westinghouse Electric Corp. met at Columbus, O.

Included in the regular monthly session were production and purchasing managers of the Columbus plant along with J. J. Anderson, manager of the major appliance division, and the product manager for refrigerators and freezers.

The Problem — Number one question facing the group: Should refrigerator production be increased? The decision was, yes, as soon as possible. Starting March 16, another shift would be added on one of the two main assembly

lines at Columbus. Roughly 300 new men would be hired.

Immediately following the meeting, production men began drawing up schedules of March output. By Saturday the master schedule was completed and copies were in the hands of manufacturing departments. By Monday, March buying schedules were going out to suppliers.

The Strategy — This chain of events typifies a process that is going on throughout industry today. The general recovery is bringing plants up against decisions on when and how to increase production. Important money rides on the steps taken.

The approach of Westinghouse refrigerator men to the problem is worth studying. Market and cost pressures leave little margin of error for the refrigerator group. If they move too soon, they can scuttle their whole market. If they react slowly, they lose sales. An inef-

ficient buildup cuts into slim profit spreads.

The Strategist — Living with these tensions and operating in a volatile market, the Columbus refrigerator team has had to develop a fast, systematic method of changing production rates. Efforts are constantly being made to improve this method; new techniques will undoubtedly be developed. But right today, the job is being done without excess waste motion.

Under the Westinghouse profit center system, a heavy responsibility for any production boost falls on the product manager. He is held accountable for losses that may result from false starts. For refrigerators and freezers, department manager W. R. Arbuckle has the job of forecasting sales and estimating production requirements.

Looking Ahead — Mr. Arbuckle must decide 90 days ahead of time how many refrigerators will be sold

by all makers, what percentage of the market will go to Westinghouse, and how the Westinghouse share will be divided among more than 50 model, color, and door combinations.

On a tentative basis, Mr. Arbuckle sets up a forecast of total units for the calendar year. For the immediate three months, the forecast is nailed down and model mix is detailed.

... To Set a Goal—Actual sales by distributors are checked against forecasts each week. In translating sales figures into production schedules, Mr. Arbuckle's group works toward a "desired" inventory level. For a given rate of sales, the number of finished units at the factory and in distributor hands should be held at a certain level.

As inventories vary with sales and output, the idea is to adjust production to restore the desired level. The difficulty is that production must be scheduled three months ahead while the sales picture is hazy a few weeks in the future.

Cautious Approach—In this situation, the recent tendency among refrigerator men has been to go slow on production. Late last spring refrigerator sales began turning upward. Cumulative industry sales ran 20 pct behind 1957 through February; 18 pct through June; and 17.5 pct through July. In August sales topped the corresponding 1957 month for the first time in the year.

Production throughout the industry was cut back sharply in the first part of 1958. It was held down in the early stages of the sales revival. Monthly reports began showing a drop in inventories.

Chain Reaction—Mr. Arbuckle had the industry figures. He knew his own situation. In late June he settled on a forecast that called for higher production. In September the Columbus plant went on a 6-day week. In October it added 600 men and a second shift on one of its two main assembly lines.

By the fourth quarter it became clear a further production hike would be needed. An output boost was scheduled for January; plans for a major increase in March began to take shape.

Tough Decision—For Mr. Arbuckle, these moves have involved tough decisions. "The big problem is always whether an increase can be sustained," he says. He feels the general trend is toward more conservative estimating. He explains that the penalties are too great to permit over optimism.

... For High Stakes—If a product man outdistances his market, he must stand the loss of any parts that must be scrapped. In the Westinghouse system, the product group is charged with the tax bite for unemployment compensation of men who are hired and then laid off. The optimist may find himself with a stock carryover that must be sold at reduced prices the next model year.

Most important, perhaps, over-production can depress the whole refrigerator market. Manufacturers have capacity to make an estimated 12 million units a year. Peak sales in 1955 were 6 million units. The last two years have averaged a little over 3 million.

... In a Sensitive Market—Under these conditions it is very easy to flood the market. This has

happened repeatedly in the past and it has resulted in recurring price weakness. Partly as a reflection of this condition, (biggest factor has been cost reduction) refrigerators are one of the few products that sell for less today than they did 10 years ago.

Production's Role—While the product manager has the big forecasting headache at Columbus, production and manufacturing men do not simply wait for official word of a boost to reach them.

"We try and keep an ear pretty close to the ground," says Frank Fox, production manager of the plant. Informal talks with sales had given him a clear idea of what was coming well before the Jan. 2 meeting.

Buyers Place Orders—As soon as the master schedule for March was completed, buying schedules started going out. The average assembly line component was scheduled to arrive two weeks ahead of use. On bulky, high value items, lead time was held to one week.

The current boost has called for few emergency measures by Westinghouse buyers.

"In general we feel a supplier should be as flexible as our own shop in making deliveries," says Harry L. Johnson, purchasing agent for the Columbus works.



PLANNING TEAM: These men make production-planning decisions for refrigerator division at Westinghouse Columbus, O., plant.

Coal Rides to User In Pipeline

New Method for Transporting Solid Materials

Success of a new 108-mile pipeline for pumping coal has spurred hope for an eventual nationwide pipe system transporting solids.

Both builder and user herald the new line—which runs from an Ohio mine to a Cleveland area powerhouse—as a major step forward.

Other Uses?—“A prelude to a network of systems for handling

solids,” says V. D. Hanson, chief mechanical engineer of Pittsburgh Consolidation Coal Co. which built the line.

It marks, “a new era in the transport of solid materials,” according to E. L. Lindseth, president of the Cleveland Electric Illuminating Co., the user.

“This method could be used to transfer other bulk materials,” says C. A. Dauber, CEI mechanical engineering director.

The \$13.5 million pipeline is expected to carry more than 1,350,000 tons of coal a year between the Pitt-Consol mine at Cadiz, O., and CEI's new 660,000 kw generating station at Eastlake near Cleveland. (See map.)

What It Saves—It will supply approximately 80 pct of the plant's yearly coal needs—equal to the contents of about 22,000 railroad hopper cars.

Engineers estimate the pipeline will save more than a million dollars a year, cutting transport costs about 35 pct. Other advantages: The utility has a steady supply source and the supplier a steady customer. For CEI the pipeline stabilizes coal transport costs—a major aid for a utility operating at fixed costs for power.

How It Works—Coal moves through at about three miles an hour, around the same speed oil travels through a pipeline. The coal line transports an average 170 tons an hour, has hit 200 tons an hour.

Here's how it operates:

A 50-50 slurry of water and crushed coal is made up at the mine washing plant and put into the line at Cadiz. Pumping is done by reciprocating oil country units normally used for pumping drilling mud into drill holes. There are two

pumps in the first station with two duplicate stations 30 and 60 miles north.

How It's Built—At Eastlake the coal is dewatered with thickeners, goes through flocculators and flash dryers. This gets it down to a maximum 5 pct moisture content for feeding into boilers.

The pipe is made of 15,000 tons of seamless tubing with 11 $\frac{3}{4}$ in. OD and variations in wall thickness to a maximum of 0.7 in. Thicker walls are used nearest the three pumping stations. Pipe erosion has been less than estimated.

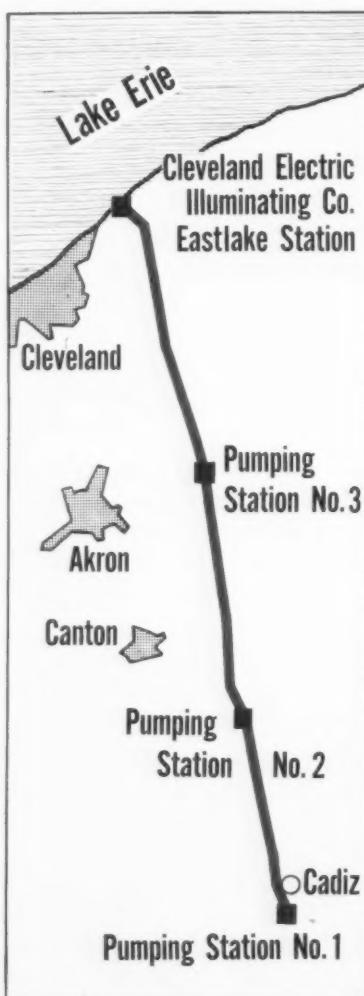
... And Protected—Externally the pipe is buried under the frost line, about 4 to 5 ft deep and has an enamel coating reinforced with glass cloth. It will receive cathodic protection later.

Erosion during use is minor because the coal is clean with no silt or ash. Also, it has greasy qualities. Attrition wears off sharp edges quickly and makes coal pieces spherical.

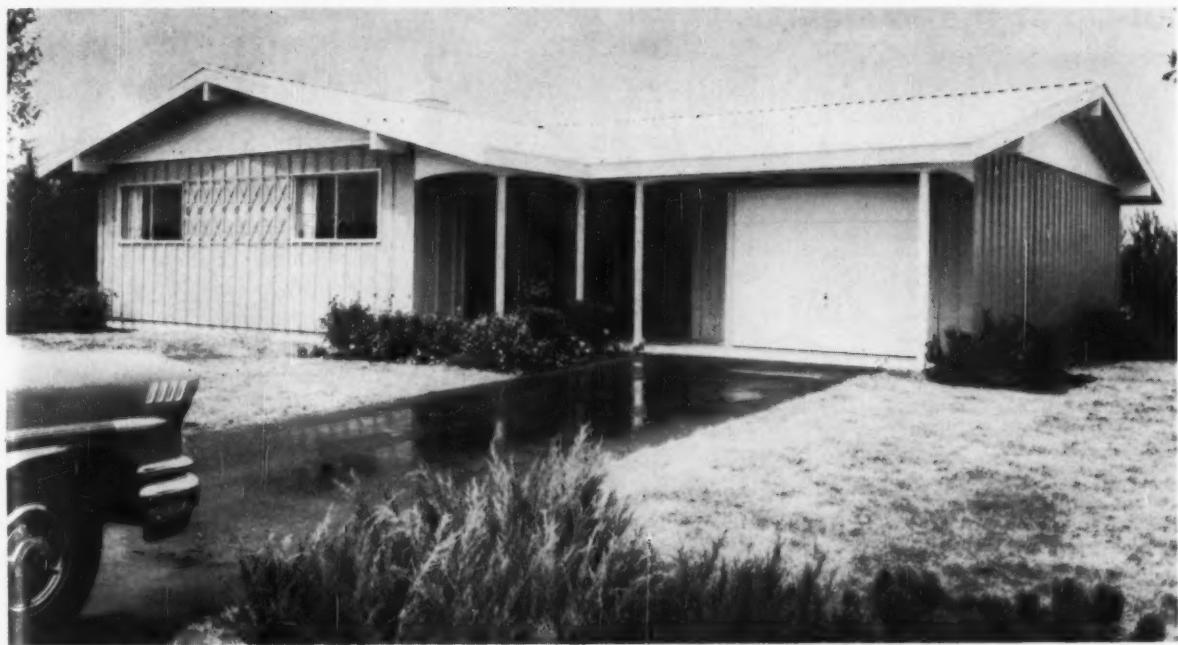
Corrosion is as great a threat as erosion. Internally, the slurry pumped is treated with caustic soda to minimize sulphur corrosion and rust inhibitor is added to keep the solution alkaline (over 7 pH).

First Problems—The line started up last April but became plugged for about 6 weeks. Pieces of coal up to $\frac{1}{2}$ in. diam were put in the line. While they were too heavy for the water to push them along they did travel 20 miles—far beyond estimates. Maximum coal size should have been 14 mesh.

The line had to be cut open in 2 places and high pressure pumps used to push the coal up the maximum incline of 11 degrees.



THIRTY HOUR RIDE: Coal particles in slurry move underground in 108-mile pipeline with aid of three pumping stations.



ALUMINUM EYE APPEAL: National Homes' Viking house features aluminum walls, roof, windows and doors.

Coming: More Aluminum Houses

Aluminum producers are pouring more sales effort into their No. 1 market—housing.

This year home construction use of aluminum could top 430,000,000 lb.—By K. W. Bennett.

■ Aluminum makers are racing for the residential housing market.

Aluminum housing is called the industry's No. 1 market for the immediate future. Aluminum makers have toiled at the home market for years. But the suddenness of the breakthrough has caused some gasping.

Sales Moves — One aluminum producer established a full time "residential" aluminum sales force just six weeks ago. Kaiser Aluminum has hired former National Association of Homebuilders executive William Slump. Federal housing chief A. Coles will leave the government and head the Reynolds Metals force.

Alcoa, pioneer in aluminum for homes (their "Carefree Home" promotion began in 1957) has 35 men working at the housing market along with their regular sales work.

Main Uses — The poundage of aluminum sheet and extrusions used in residential construction was estimated at above 300,000,000 lb in 1958. This is about 10 pct of aluminum output. New houses used 55,000,000 lb. Around 250,000,000 lb renovated existing homes.

In 1959, new houses will use 130,000,000 lb of aluminum. Builders will face-lift existing homes with 10 pct more aluminum than they used in 1958. Aluminum for home construction in 1959 could exceed 430,000,000 lb.

Extrusions, usually for windows, have been a main aluminum use in the residential field. This year will see sheet forge solidly ahead, builders believe. Sheets for roofing, siding, and filler plates for the

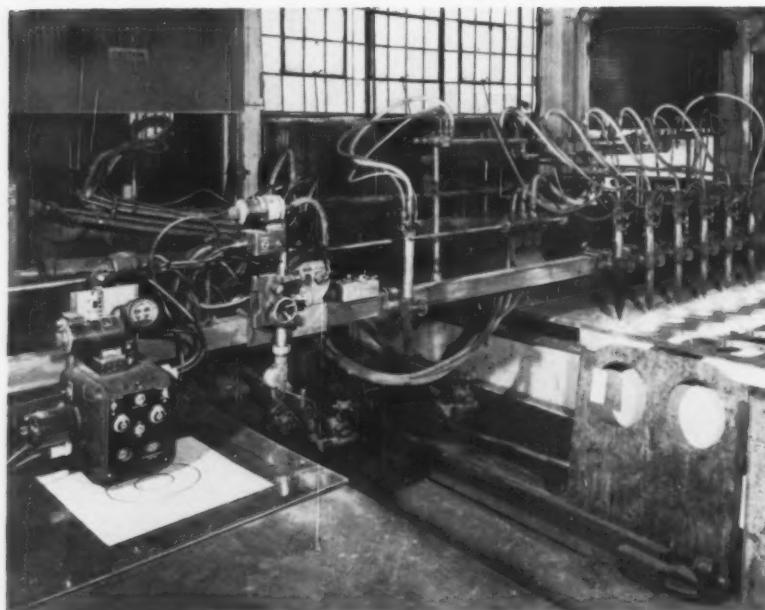
underside of the roof overhang, are expected to pull aluminum use per new home up from a 55 lb per house 1958 average, to 100 lb per house this year. The figure should reach 1500 lb by 1965. Some estimates exceed 2000 lb.

Big Share in Prefab — A market analyst believes 150,000 prefab homes will go up in 1959, and that 35 pct of them will be aluminum.

National Homes, biggest of the prefab home builders, has already doubled last year's sales volume for the same period. The company reports 50 pct of its sales are aluminum homes. Harnischfeger Homes, a pioneer in aluminum experimentation, has hinted it will announce an aluminum home this fall.

At least 20 prefab builders are actively developing aluminum home plans, and at least 50 have indicated a strong interest in them.

Cut-Up at the Warehouse



KEY PIECE: One of the most important, and interesting, pieces of equipment in the new Jones & Laughlin Steel Corp. warehouse in Detroit, is the electronic tracing device, at the left, which guides the multiple torch flame cutting machines. It allows cutting identical parts either singly or up to eight at a time. And the machine never touches the template pattern, which permits reuse any number of times.

Chicago Seeks Money To Develop Its Port

Chicago port officials will seek another \$25 million in private financing for development of the port. Though the St. Lawrence Seaway isn't complete yet, Chicago port executives say an earlier \$25 million bond issue is already making profit.

Chicago is the first U. S. port to use full private financing for its development.

Here's the Market — It's estimated that Chicago will serve as inland seaport for parts of nine Mideastern states. The Chicago outlet for export goods has a land-freight rate advantage over other U. S. ports in that area.

The actual trade area is already proving larger, with manufacturers from 15 states pouring over \$3.5 billion of export goods through Chicago yearly. Machinery and instru-

ments produced by metalworkers in the area are the leaders in dollar value of goods shipped. These goods are already topped \$2.012 billion per year. The 40,000 tons of machinery annually shipped at present is now expected to rise over 150,000 tons annually when the Seaway opens, a 200 pct gain by 1965.

Toward the Rising Sun — At the moment, number-one customer is Japan. Chicago metalworkers expect to develop the European market more strongly with the opening of the Seaway, and with an International Trade Fair this summer. A port study conducted by Chicago, and major metalworkers in the Midwest, shows a potential export market exceeding \$13 billion.

Canadian maritime groups, which joined in the study, predict Chicago will head the list of U. S. ocean-traffic freight ports. One Canadian spokesman estimates this

single port already equals the present facilities of all other lake ports combined.

Defines States' Right On Union Control

State powers to regulate labor-management relations have been pared by a new U. S. Supreme Court decision. The Court says states cannot apply their own anti-trust restrictions to labor contract provisions sanctioned by federal laws.

A 5-1 high court majority, headed by Justice Brennan, holds that only Congress has the power to limit the scope of labor-management agreements permitted under federal law.

The Test Case — At issue in the case were Ohio court rulings prohibiting Teamster Union efforts to include in its labor contracts with truck firms special provisions to cover pay of drivers who own their own trucks but drive for a company. The state courts held such drivers were independent contractors, and union restrictions on their pay amounted to a restraint of trade in violation of state anti-trust laws.

Justice Brennan, speaking for the majority, says that the union has the right to negotiate these fees because the owner-drivers — union members — should be protected against lower-than-cost arrangements for their equipment. Such arrangements are proper bargaining subjects under federal law, the majority says, and beyond the scope of state control.

Steel Merger Talks

Pittsburgh Steel Co. and Sharon Steel Corp. have been looking into the possibilities of a merger. That's all either management will say at this time. No agreement has been reached.

Sharon has been a producer of alloy and stainless steels, as well as carbon steel products. Pittsburgh Steel is a carbon steel mill.

DENISON Announces...

NEW 2 to 8-ton "E-SERIES" Multipress line

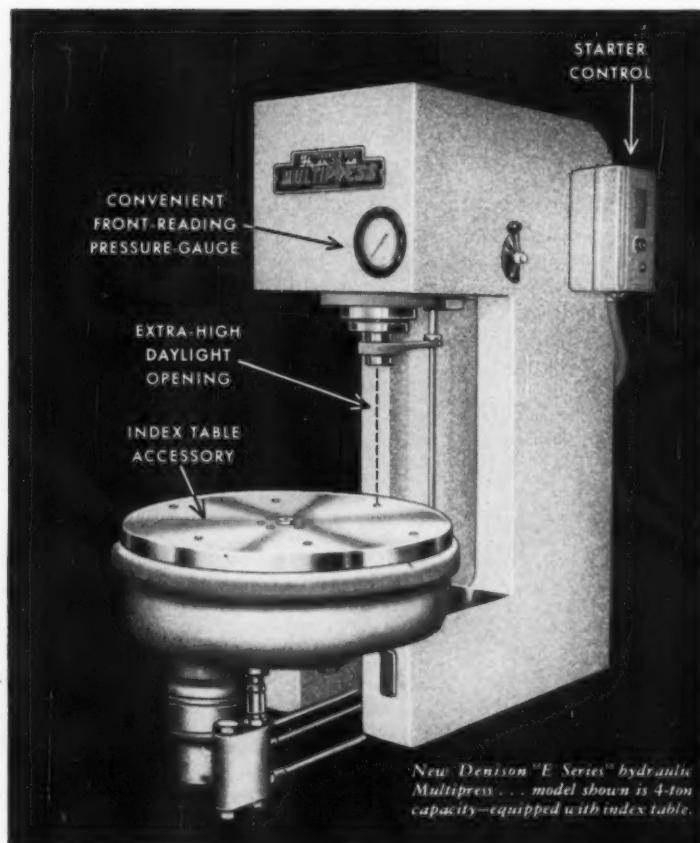
- BENCH PRESSES WITH BIG PRESS PERFORMANCE
- LOW-COST REPLACEMENT FOR OUT-MODED FLOOR PRESSES
- MORE TONNAGE PER DOLLAR...MORE DAYLIGHT FOR WIDER TOOLING RANGE



FOR 101 PRESSING JOBS . . . new "E Series" Multipress packs maximum big press performance in bench press space. 4-ton Multipress is shown above on rigid, lightweight bench accessory.

HERE'S WHY IT'LL PAY YOU to check your production against the features of Denison's new "E Series" hydraulic Multipress line—

- **BIG PRESS PERFORMANCE** in a bench model size. Ram speeds: Closing up to 1450 ipm. Pressing up to 570 ipm. Return up to 920 ipm.
- **MORE DAYLIGHT** than comparable presses . . . 18" opening adapts extra-wide range of tooling.
- **SAVES FLOOR SPACE** . . . compact design (16" x 26" x 49") can do floor press jobs in bench press space.
- **GREATER TONNAGE** for its size than any comparable press.
- **MOBILITY** . . . makes operations more flexible. Fast and easy-to-move anywhere in your production area.
- **MANUAL OR AUTOMATIC OPERATION** . . . Can also be equipped with Denison accessories—including feeds and index tables.
- **LOW-COST** . . . designed expressly to replace outmoded, heavy floor presses and still do the job.
- **OPERATING FEATURES** . . . oil smooth hydraulic power system . . . completely self-contained unit . . . rapid cycle time . . . fast, simple setup . . . interlocked safety controls . . . precision-controlled, adjustable ram pressures.



THE SECRET of Denison's new "E Series" hydraulic Multipress line is in this production-proved fact: Properly applied lower pressures produce better quality products *more efficiently and with less scrap*—than misapplied higher pressures. Construction and control features of the "E Series" Multipress are designed to give maximum performance at lowest possible cost.

Write for full details in Bulletin M-34.

DENISON ENGINEERING DIVISION American Brake Shoe Co.

1242 Dublin Road • Columbus 16, Ohio

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"The Board balked at first...

but I convinced them that now was a good time to buy!"

When machine tool builders work with smaller backlogs they're naturally more efficient and can make better deliveries...are more able to control costs...more able to render the many *extra* custom engineering services that disrupt regular production during peak schedules. As a matter of fact, many progressive buyers are at their busiest now...taking advantage of the sound buying position the economy gives them as it pauses for its breath...seizing the opportunity to get ready for tomorrow today.

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John C. Cleaver

That New Look in Boiler Rooms

The young packaged boiler industry owes much of its start to Mr. Cleaver.

He had trouble convincing industry that boilers can be neat, compact, and quickly installed.

■ "Come back when you've sold 20,000."

Those words tossed at John C. Cleaver by a skeptical sales prospect 26 years ago would have been enough to make a less enthusiastic boiler salesman think of changing his occupation. It doesn't take long to sell 20,000 nuts and bolts. But boilers—that's another story.

J. C. Cleaver wasn't an ordinary salesman. He was co-inventor, along with R. E. Brooks, of the packaged boiler equipment he was trying to sell. At the time, he was also vice president-treasurer of the neophyte Cleaver-Brooks Co., and research and product development man, all rolled into one.

Breaking the Ice—The two men had a tough missionary job ahead of them. The on-the-job, built-up boiler principle was firmly entrenched and many engineers looked with disapproving eye on the young upstarts and their new-fangled machine.

The pair actually developed the packaged boiler in 1932 for highway contractors to heat asphalt and road oils in tank cars. Then, the same year, a small dairy in Kenosha, Wis., had a breakdown of one of its permanent boilers. As a temporary measure it installed a Cleaver-Brooks portable unit.

Over the Hump—The dairy management was so pleased with the efficiency of the unit that they made



J. C. CLEAVER: After 26 years, 20,000 boilers.

it a permanent installation simply by removing the wheels. Messrs. Cleaver and Brooks took the cue and set out to design special units to serve as packaged boiler installations. It was the birth of a new industry.

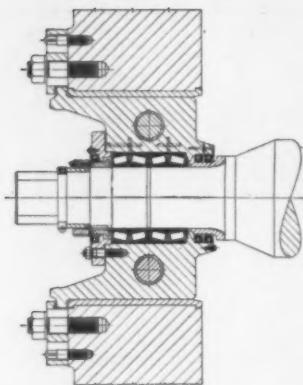
For the next 10 years, Cleaver-Brooks was practically the only producer of self-contained boilers in the U. S. It was a rugged job selling this concept to the field, recalls Mr. Cleaver. They weren't over the hump until World War II, when widespread use of packaged boilers in landing ships, advanced bases, and temporary hospitals paved the way for mass acceptance.

Mr. Cleaver is now president of

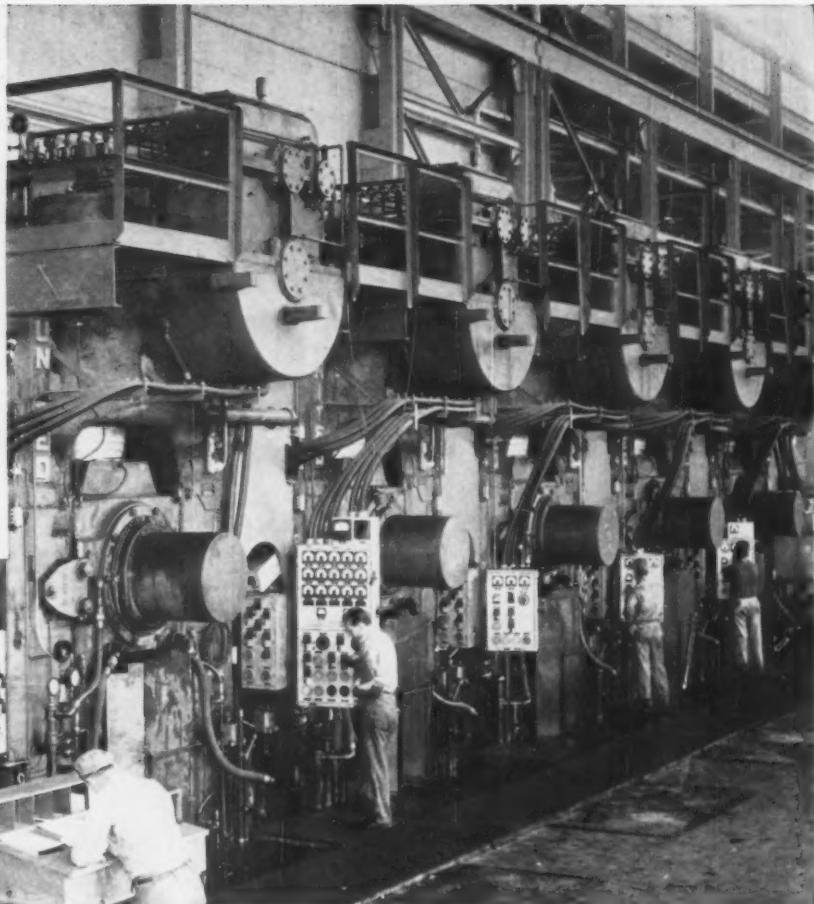
the Milwaukee-based company and Mr. Brooks is board chairman. Sales last year were \$15 million. The company has a plant at Lebanon, Pa., and recently purchased Springfield Boiler Co., Springfield, Ill.

Milestone Is Passed—One day, a few weeks ago, Mr. Cleaver called company officials together in the Milwaukee shop and carried out a brief ceremony. The 20,000th packaged boiler had rolled off the production line.

"The 20,000 figure may not seem impressive in this day of astronomical digits," says Mr. Cleaver, "but in the packaged boiler field it represents a notable achievement."



Work rolls are mounted on Timken Tapered Roller Bearings as in this typical application.



New design TIMKEN® bearings carry a big load at Kaiser Steel

THIS United Engineering-built 4-Hi cold mill uses a new design of Timken® bearing on the work rolls. 20 Timken tapered roller bearings in all. This mill is located at Kaiser Steel's Fontana Works, where 37 stands of hot and cold mills use Timken bearings.

With 20% greater radial and 80% greater thrust capacity, internally redesigned Timken bearings can give you greater tonnage life per bearing. And because the new design bearings give more capacity at no increase in space, they make higher performance, lower operating cost possible.

Their tapered construction lets

Timken bearings take both radial and thrust loads. No extra thrust devices are needed—further cost-and-space savings. Because they're geometrically designed and precision-made to roll true, Timken bearings practically eliminate friction. They *roll* the loads.

These new design Timken work roll bearings are running up outstanding records because: 1) Timken advanced engineering designed these bearings specifically for the job; 2) They are precision-manufactured for longer life. Performance records by mill operators everywhere (one reports 75% more tonnage life per bearing) show

that Timken work roll bearings provide lowest cost per ton of steel rolled.

Specify Timken tapered roller bearings for your new or existing mill equipment. They make machines better. And better machines do better work. That's BETTER-ness. Its symbol is the trade-mark "TIMKEN". Look for it on *your* bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable: "TIMROSCO".



This symbol on a product means its bearings are the best.

BETTER-ness rolls on

TIMKEN®

tapered roller bearings

High Tide Is Past for Export

If you've noticed a down-trend in export business lately, you're not alone.

The decline is causing many U. S. companies to re-evaluate overseas markets.

■ It's not easy to face up to it, but what's happening to our overseas markets is a matter of growing concern.

Very few metalworking groups look for any kind of an increase in exports this year. Looking even farther ahead, the long-term outlook for selling most manufactured products abroad is not good.

Export Old-Fashioned—The fact is that many companies have virtually abandoned the old-fashioned idea of export. They have given up their export markets—or they have decided to manufacture abroad.

No one is pointing the finger at the manufacturer. Two factors, in effect, have cut him off from many world markets. These are high manufacturing costs at home (principally labor) and restrictive measures abroad that conspire against the American-made product.

Export Technology—What hurts even more is that Americans have been urged to export their technical knowledge. This has been so successful that productivity of many European countries and Japan is at a level almost equal to that at home.

You can argue that sending a manufacturing operation overseas doesn't hurt the American economy. After all, the profits come home and can be spent in new business in this country, distributed in dividends, or otherwise spread out to

enrich the economy.

Workers Hurt—Probably the biggest losers are the workers. They are standing by, seeing operations they once performed taken out of their plants and sent overseas.

And, while many businessmen don't like to talk about it, it won't be long before products of overseas divisions of U. S. companies come back to compete against domestic products.

This is already the case in the auto industry to name one topical product. U. S. automakers are importing their own European-made cars to compete against domestic products. Of course, it is a defen-

sive measure, but it is done nevertheless.

No Easy Way Out—There is no easy solution. It is also argued that as Europe's standard of living rises, so will labor costs. It is possible that the tremendous advantage of lower wages may, in time, be wiped out. But it's a long time to wait.

And there's an even more sinister threat. This discussion has referred entirely to the Free World, our friends. Meanwhile, Russia is moving in. One thing offered: Credit terms that can not possibly be met by American, privately-owned companies.

Solid Surge in Durables

■ A lot of the hope placed in consumer durables this year was pure wishful thinking. But it now turns out that this hope may be justified after all.

In bringing the Federal Reserve Board's Index of Industrial Production up to 142 in December, the big tag items did more than their share.

Better Than Expected—For review, the best that could be expected of the FRB Index a few months ago was about 140 at the turn of the year. The 142 level means that most of the recession decline has been wiped out, although production is still three points below the pre-recession level.

The Index for all consumer durable goods in December, 1958, stood at 137, up three points over November, and compared with 119 of December, 1957.

Big Push in Autos—The big surge occurred in autos, up 18 points from a year ago, although other heavy consumer products continued to keep on the upgrade.

Some other conclusions in overall business conditions:

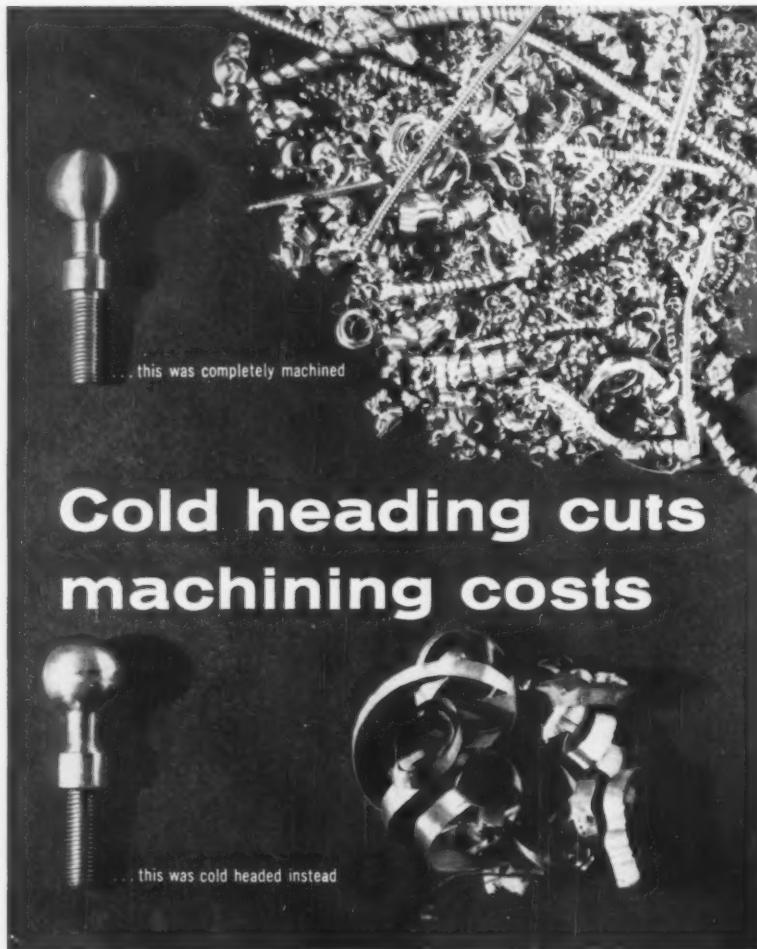
Industrial production continues to climb. Construction and retail sales hit new high in December and show no signs of decline.

Carloadings to Gain In First Quarter

One indicator of business is the quarterly estimates of the railroads of freight car loadings.

On the basis of best first quarter guesses, about 5.9 pct more commodities will travel over the nation's roadbeds in the first quarter of 1959 than in the first three months of last year.

ECONOMIC FACTS ON FASTENERS



Cold heading cuts machining costs



- **Buy cold headed parts . . . produced with less scrap, in less time than machining**
- **You get stronger items, in one piece, at big savings**

Above you see an automotive part formerly machined, along with scrap turnings. Compare with the piece below—where metal has been forced to cold flow into shape in one of RB&W's cold heading machines. (That's the same equipment that produces RB&W bolts, thousands per hour, at rock bottom cost.)

It's obvious that cold headed parts save money. (Little or no scrap loss, faster production.) Not so apparent is the fact that the cold headed piece is actually *stronger*, too. The cold working does it. Also gives a better finish and oftentimes closer tolerances.

Cold headers used for fasteners can be adapted to almost any small parts now machined or forged as one

or more pieces. That's where an expert can help you. Avail yourself of the RB&W Fastener Man to analyze your requirements. People who have already done so are profiting from RB&W's vast cold heading facilities and ability to supply large volumes at substantial savings. Russell, Burdsall & Ward Bolt and Nut Company.



Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Fargo. **Distributors from coast to coast.**

RB&W FASTENERS—STRONG POINT OF ANY ASSEMBLY

Superior joints in heavy duty products

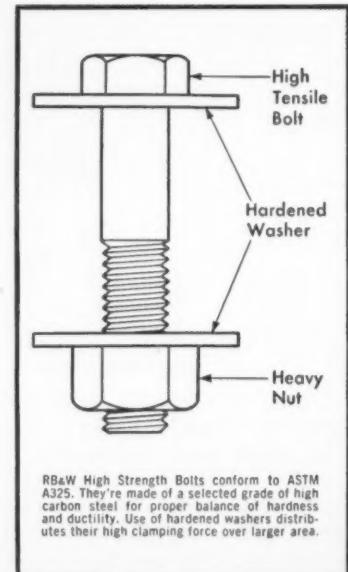
... achieved with RB&W High Strength Bolts

Plenty of experience now proves you can stop fastener failures with high strength bolts. Especially in products subjected to much vibration in service. Properly tightened, these bolts make the joints not only *permanently* tight, but *stronger*.

Here's why: A joint is only as strong as the *residual tension* left in fasteners after tightening. The more you tighten, the better it is.

RB&W High Strength Bolts allow a high level of tightening. Friction between bolted surfaces increases with the tightening, so that slippage of the joined members against each other can't take place. This makes the joint better able to resist external forces which try to shear or separate the joint.

In addition, with high residual tension, these fasteners are also more immune to the fatiguing and loosening effects of loads which constantly vary, such as vibration.



RB&W High Strength Bolts conform to ASTM A325. They're made of a selected grade of high carbon steel for proper balance of hardness and ductility. Use of hardened washers distributes their high clamping force over larger area.

As a result, one manufacturer of heavy duty shaker equipment has found them the only answer in troublesome joints which formerly required constant maintenance. Others are ending rivet failure and costly replacement in cranes, ore unloaders and freight cars with RB&W High Strength Bolts.

If you're making similar or related heavy duty equipment, talk it over with an RB&W Fastener Man.

Buying Patterns Are Changing

Four-Doors and Station Wagons Catch Buyers' Fancy

More 1958 buyers turned their backs on two-door models.

They made four-door sedans an even bigger favorite, and continued the growth of the station wagon. — By H. R. Neal.

It looks like buyers are slowly turning away from two-door models toward four doors—in both sedans and hardtops. The good old four-door sedan registered the largest gain in popularity in 1958, to strengthen its position as the number-one choice of buyers.

There was little change in convertible sales, nor is there likely to be. The pattern is that good year sales differ little from bad years. It is a steady, but unspectacular model, partly because of the price premium.

Wagon on the Move — Func-

tionalism of station wagons continues to attract more buyers, and this trend is likely to continue. In 1958 they came within one pct of becoming the second most popular body style.

Station wagons accounted for 649,196 of 1958 total car production of 4,219,559, according to *Automotive News*, the industry newspaper. This is 15.4 pct of production, and is a 1.8 pct increase over 1957's showing of 13.6 pct. Two years ago only 10.9 pct of the year's production was wagons.

As might be expected, lower-priced lines accounted for the bulk of the increase. But medium-priced makes also showed an increase in the percent of production devoted to the versatile, but more expensive model.

Source of Strength—Nearly 20 pct of lower-priced cars built last

year were station wagons, up from slightly more than 17 pct the previous year. About 8 pct of the medium-priced cars were in this category, compared with 7.7 pct in 1957. None of the high-priced lines offer station wagons.

But the gains of station wagons were overshadowed by a resurgence of favor towards four-door sedans in both lower- and medium-priced classes. Output of 1,460,478 four-door sedans gave this body style 34.6 pct of industry production, compared with 32.6 pct the previous year.

Middle Class Support — This model showed its greatest comeback in the medium-priced field where it accounted for 33 pct of production, compared with slightly more than 27 pct in the year before. Among low-priced makes it took 37 pct of production, only

Luxury Is Standard Equipment on New Cadillac



1959 ELDORADO BROUHAM: Cadillac's top model, introduced last week, has all the finest comfort

features in the realm of automaking. Manufacturers suggested price, \$13,075.

slightly better than the 36.4 pct of the preceding year.

Only among the high-priced makes did four-door sedans continue to lose ground. They dropped to 5.6 pct of production as four-door hardtops rose to claim nearly 57 pct of output.

Fall From Favor — Overall, hardtop models showed a decline in share of the market last year. Some 685,864 two-door hardtops were produced, according to Automotive News, representing 16.25 pct of total production. In the previous year they held 19 pct of production.

Among lower-priced makes, they accounted for 12.3 pct of production. It had been 13.9 pct. Medium-priced makes saw the two-door hardtops drop 4 pct, to 23.75 pct of their volume. And even among high-priced makes they dropped to 30 pct of production from 35.3 pct.

More Doors Don't Score — Some 547,016 four-door hardtops were produced during the year as this model dropped in popularity from

14 pct to 13 pct. Among lower-priced models production went from 6 pct to 5.3 pct. And the share of medium-priced production declined a little, to 25 pct from 26.8 pct.

Despite the recession, convertibles took a little larger share of the market than in 1957 with production of 185,604 "soft-tops." This is 4.4 pct of the market, up from 4 pct.

Two-door sedans, as a group, fell off slightly last year—down 0.2 pct from 1957's 16.6 pct. But this is a decline of slightly more than 3 pct in the past two years. They have been dropped entirely by high-priced lines and accounted for only 6.2 pct of medium-priced production.

AMC Business Is Good

American Motors is galloping down the profit trail again. After bucking the recession of 1958 and coming up with AMC's first profitable year, the smaller-car concept is paying off bigger than ever.

In the first quarter of its fiscal

Automotive Production

WEEK ENDING	CARS	TRUCKS
Jan. 24, 1959	129,599	24,597
Jan. 17, 1959	135,953	22,577
Jan. 25, 1958	107,495	18,221
Jan. 18, 1958	109,761	18,627
TO DATE 1959	428,845	73,252
TO DATE 1958	389,096	62,649

*Preliminary

Source: Ward's Reports

year (1958's fourth quarter) the company turned a profit of \$21 million. In the same quarter a year ago the company showed a profit of slightly less than \$5 million. The first quarter showing is not too far behind the \$26 million profit earned in the company's entire previous fiscal year.

Ramblers are Rolling — In the last three months of the year AMC built 84,279 Ramblers, more than double the 41,492 units produced in the same period a year ago. At the same time, sales amounted to \$193.7 million, up from \$118.6 million. And profits jumped to nearly 11 pct of sales for the quarter. A year earlier they were just over four pct.

Small Cars Go Big

Starting this month, Buick intends to import more German-built Opel sedans and station wagons. At the same time, the price on the imports is dropped \$100.

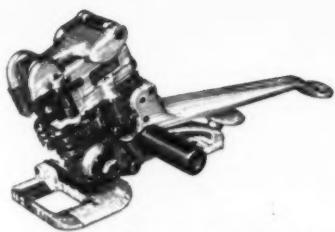
The new schedule calls for importing 3750 cars per month. This is nearly four times the monthly rate of 1000 units scheduled when the Opel was first offered.

Pontiac, which imports and markets GM's English-built Vauxhall, has also lowered its price by \$100. In both cases, increased sales volume was given as the reason.

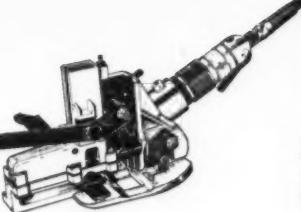
The English Ford line has marked the beginning of its second decade in the American market by scheduling 27,000 units for import into the U. S. during the first half of 1959. This is nearly three-fourths of the total of 39,000 English Fords imported all last year.

The Bull of the Woods

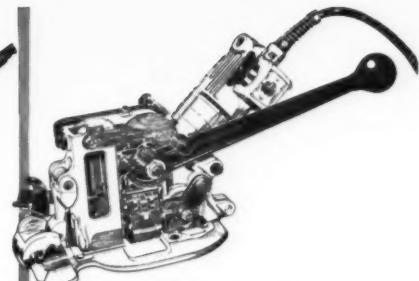




The only one-hand
strapping tools
SFC Series



Air power portable
strapping machines
AP Series



Electric portable
strapping machines
AE Series



Complete line of air
power tensioning tools
PN Series

The only air power feed wheel
tensioning tool for heavy duty
strapping



FN Series



Heavy-duty air
power sealers
N Series

Make your product cost less to handle, store, ship, and receive

Binding things together with steel strapping is a low cost way to eliminate individual handlings, save space, and prevent damage. These nine machines—part of the most complete line of equipment in the steel strapping in-

dustry—create new ways to save with strapping. Signode will be glad to help you select the right equipment and devise methods to make the most of it. There's a Signode man near you. Call him today, or write:

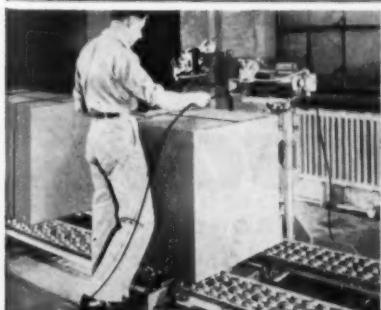


First in steel strapping

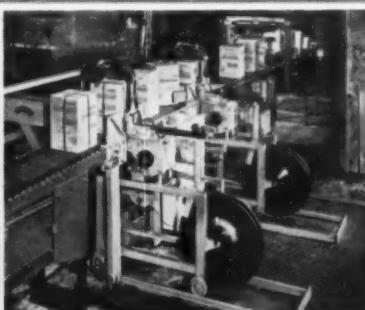
SIGNODE STEEL STRAPPING CO.

2623 N. Western Avenue, Chicago 47, Illinois

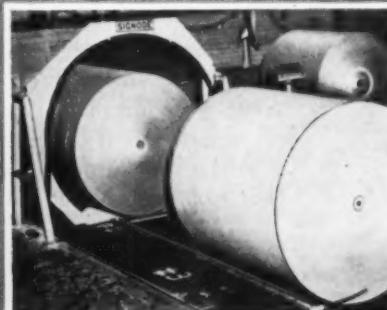
Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto



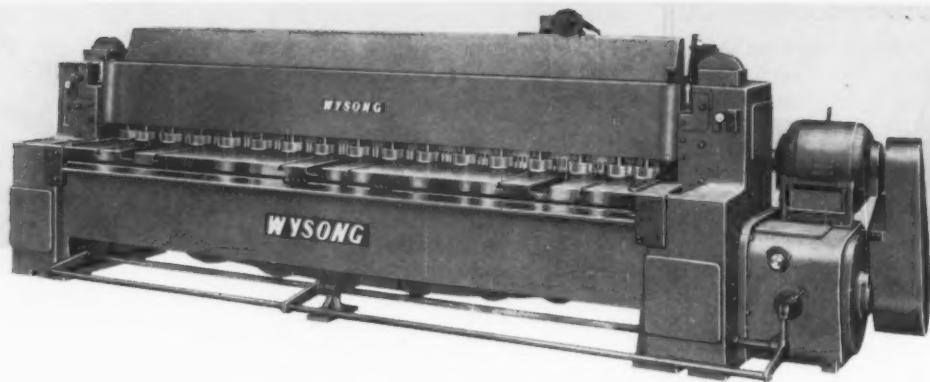
Power strap feeders
Model PSF



Fully automatic carton
strapping machines—Model M2N



Fully automatic roll and coil
strapping machines Model M2ORB



THE SHEAR

MODEL 1225 — Capacity 12' x $\frac{1}{4}$ " Other models from 24" through 12' cutting lengths and 16 ga. through $\frac{1}{2}$ " capacities.

THEY DIDN'T REMEMBER

It was a big company with a new Purchasing Agent. He didn't remember a shear bought two years ago. He did find a record of its purchase but no report on its performance.

The Production Manager recalled its installation but he didn't have a record of performance either. So he got the Foreman of the Fabricating Department on the phone.

"Joe, you have squawked about troubles you have had with some of your shears and I have your reports on them. But, I don't have any report on that Wysong shear we installed a couple of years ago. How come?"

"Well, boss, what's there to report? The only time it's been down was when we changed blade edges. It has automatic lubrication so there is practically no maintenance. It's working every day and gives us the accuracy we want — the production, too. There is nothing to report!"

When you install a Wysong don't expect a lot of reports on it — just unsurpassed accuracy, minimum down time and maximum production. That is why so many users say:

"Buy a WYSONG — it's MILES ahead"

Based on experience of Wysong service man making a routine check.

WYSONG
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Mikoyan Leaves Empty Handed

He Failed to Get U.S.-Soviet Trade Commitments

Russia wants to buy a lot more from the U. S. than we want from her.

This would mean extending credit, and Russia's rating is very poor.—By G. H. Baker.

Anastas I. Mikoyan, top U. S. S. R. trade expert, tried hard to pick up some commitments from U. S. industry leaders for increasing U. S.-Russian trade. He was not successful.

Basic reason: Russia wants to buy far more from us than we need or want from her. To offset this deficit the Reds seek credit here.

Usually Overdue—It is unlikely they'll get much credit. They are notoriously slow in paying their bills. Also, the Reds want to buy machinery and materials classed as "military" or "military-supporting." Obviously, shipment of such products to a potential enemy is hardly in the nation's best interests.

Mikoyan made it clear while in the U. S. that his government is keenly interested in buying machinery to expand its output of chemicals, plastics, and rubber. Also, the Reds are eager to buy modern food-processing and food-packaging machinery.

Unbalanced Trade—But what can we buy from them? We can only absorb so many furs, pelts, and caviar. And the dollar value of these products is insignificant compared to the machinery the U. S. S. R. wants.

Stanislas Menshikov, son of the U. S. S. R. ambassador to the U. S., has said the reaction of U. S. industrial management to Miko-

yan's visit shows "colossal interest in trade with the Soviet Union." He believes only the stuffy attitude of the Administration is standing in the way of a "tremendous" upsurge in U. S.-U. S. S. R. trade.

Favors Democrats—Mr. Menshikov hints he expects some great gains in East-West trade if the Democrats win the White House in 1960.

Johnson's Many Hats

Two Senate committees are inquiring into the pattern of national defense as it has evolved during the Eisenhower Administration. Both are headed by Senate Majority Leader Lyndon Johnson, (D., Tex.)

One probe seeks clear-cut answers from the Pentagon on the overall national preparedness.

The other is directed at finding where the nation stands in its knowledge and use of missiles, rockets.

How Johnson Does It—Senator Johnson is known as a tireless worker. He sees nothing unusual in heading two major Senate investigations simultaneously, in addition to directing the affairs of the Senate majority. He is a great "staff man," and leaves much of the routine factfinding to his alert and able—and intensely loyal—lieutenants. When the spotlights are turned on, Senator Johnson swings into the driver's seat.

Top Brass Is on the Spot

Officers Take Care—Admirals and generals who ask Congress for more money will have to weigh their words carefully this year.

The commander-in-chief—Ike—has issued strict instructions to all Army, Navy, and Air Force officials to support his budget.

This means the military is to agree that \$40.9 billion will buy sufficient national defense for the 12 months starting July 1.

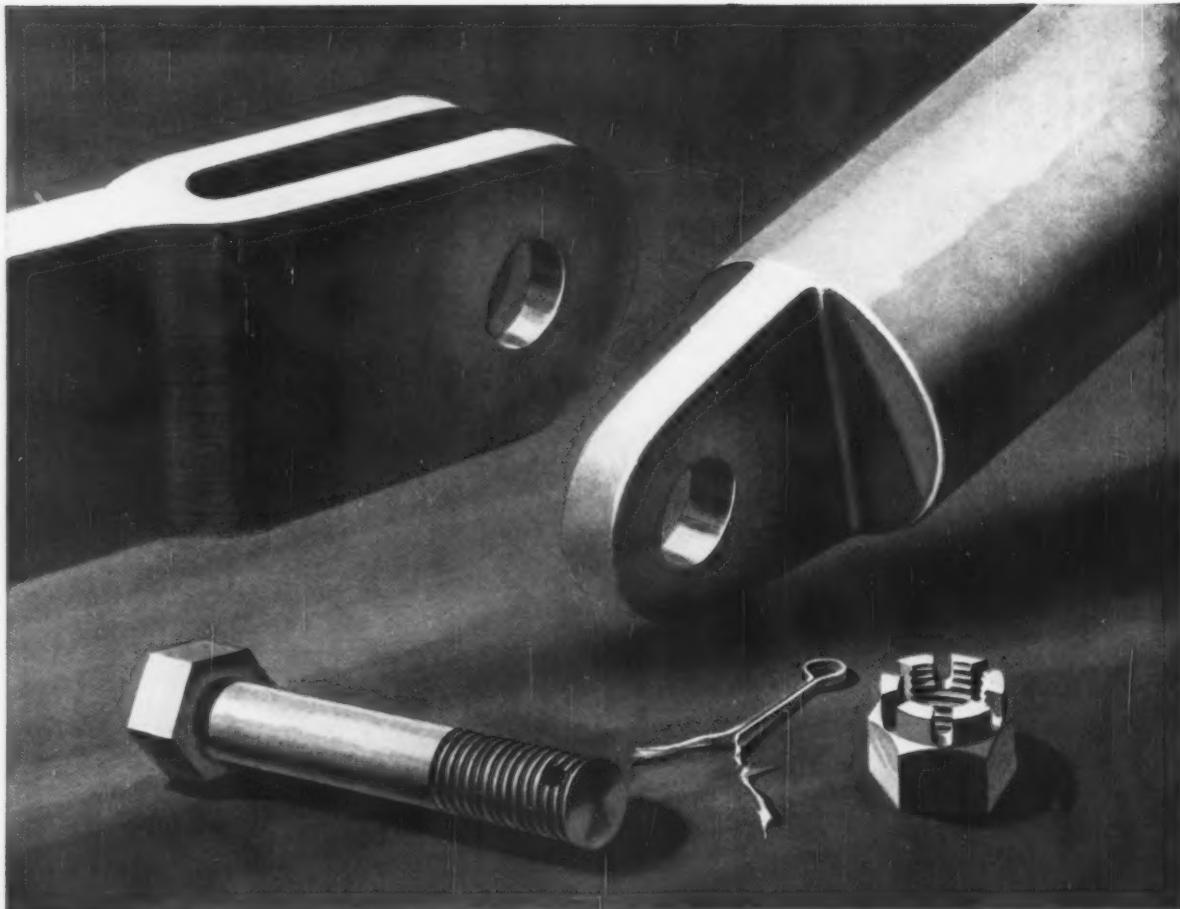
The Problem—Mr. Eisenhower may be correct, but no bureaucrat—certainly no admiral or general—is ever ready to admit his department, agency, or unit is as strong as he'd like it to be,—or that its budget is adequate.

Government officials are slipping the word to friendly congressmen

that the nation's defenses are seriously impaired by the penny-pinching attitude at the top. This is particularly common when one party controls Congress, and the other is in the White House.

The Alternatives—Every admiral and general called to testify on this to the Senate and House appropriations committees has the tiger by the tail. If they make a strong pitch for more dollars for their programs, as they would like to, they are in serious trouble with Ike, and could lose their plush assignments as a result.

If they don't ask for extra money, they may see some spending programs closed out, and themselves transferred to new projects.



Somebody saved $\frac{1}{4}$ ¢ on this fastening

But something was missing when costs for the cassetted nut and cotter pin unit were figured. The extra expense of field service calls; the cost of "downtime" to the customer; the value of your company's reputation as a manufacturer. Add these factors in . . . then the one quarter cent for the **double dependability** of an Elastic Stop nut becomes the lowest cost insurance you can obtain for the protection of your equipment and your reputation.

No component, part or material which fails under the stresses of normal product performance can be economical . . . no matter how low the initial cost. Failure of the smallest part is failure of the equipment.

Because they cannot be shaken loose . . . because the exclusive nylon locking insert retains original

locking torque throughout the most rugged operating conditions — Elastic Stop nuts insure against breakdowns through fastener failure. And, because Elastic Stop nuts eliminate the possibility of product failure caused by loosened fasteners . . . *they are truly the most economical fasteners available.*

For detailed photos showing how some of America's foremost manufacturers of heavy equipment have insured critical bolted connections with Elastic Stop nuts on such units as rock drills, scrapers, snow plows, off-the-road trucks . . . write to ESNA. Or, for first hand proof, tell us the preferred size and we'll send you test samples. Address: Dept. S24-177, Elastic Stop Nut Corporation of America, 2330 Vauxhall Road, Union, New Jersey.



DOUBLE DEPENDABILITY

The dependability built into every Elastic Stop nut builds itself into the dependability of every product on which it is used.

ELASTIC STOP NUT CORPORATION OF AMERICA



Missilemaking Is Big Business

Farwest Gets Large Share of the Contracts

Boeing at Seattle is working on the Minuteman advanced missile program.

Douglas, Convair, North American, and Aerojet-General are other concerns deep in missile building.—By R. R. Kay.

■ Ballistic missile contracts in the Farwest have soared into the billion dollar range.

The growth is important to missile contractors in the area. But it's also important to suppliers of metalworking services and equipment. They share in the West Coast's growing stake in missile-making.

Who Does What—Here's where major missile work is going on in the Farwest:

Boeing in Seattle has the top roll in the Minuteman program.

In Southern California Convair and Douglas make the airframes for Atlas and Thor. North American Aviation manufactures the engines for these and Jupiter.

Aerojet-General holds a contract for liquid fuel power plants on the Titan and solid fuel rocket engines for Minuteman. Minuteman is a second generation ballistic missile. It will be simpler and cheaper to operate.

How Large?—The missile industry is now reaching large-scale status. These facts show just how big it is:

Some 90,000 persons in 22 industries work in it.

Twenty-five major prime contractors and 400 major sub-contractors are included.

Over 200,000 suppliers throughout the U. S. sell this market.

Sales in Seattle

Sales of aluminum in Seattle are on the uptrend. The city is a fast-growing market for aluminum extrusions and sheet made in the state. Example: 165,000 lb of these products will go into three major office buildings.

Moving West

Northern California can expect a good year. That's what Jack H. How, president, Western Machinery Co., San Francisco, sees for 1959.

Bay Area sources say eastern manufacturing firms are considering new plants and expansions in the region.

Aluminum War?

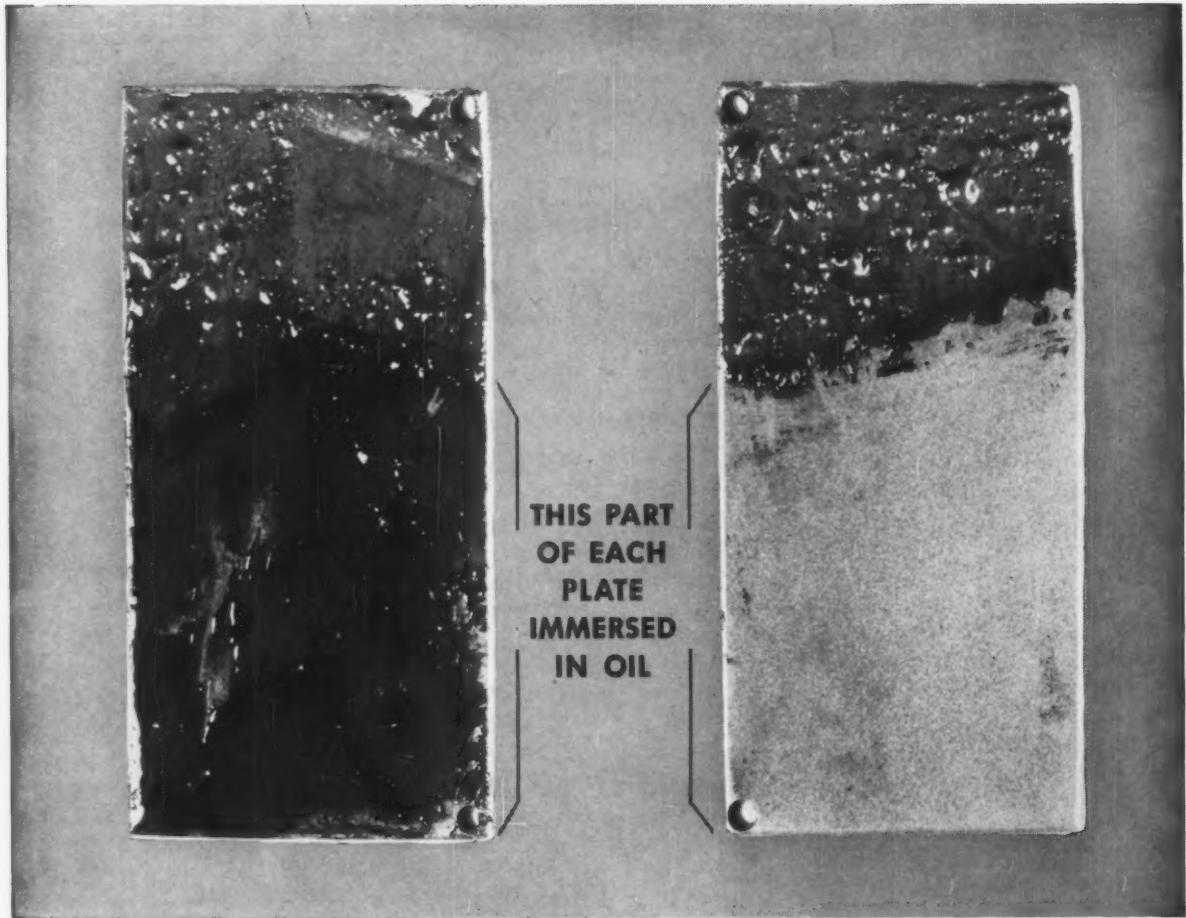
The Pacific Northwest may become a major battlefield in the Soviet Union's economic war against the U. S. Thirty percent of U. S. primary aluminum production is centered there.

It could be rough if the Russians should switch more of their hydro-electric power to aluminum production and invade the Northwest market.

Kaiser Steel Adds Pig Iron Capacity



NEW BLAST FURNACE: First molten pig iron flows from new furnace at Fontana Works of Kaiser Steel. New unit—designed to produce 1750 tons of pig a day—is largest blast furnace on the West Coast.



This sludge-coated metal plate was partially immersed in a beaker containing a *regular hydraulic oil* heated to normal operating temperature. Though the oil was agitated throughout the test, nearly all the sludge remained on the plate.

This similarly sludge-coated plate was partly immersed in a **SUNVIS 700** oil, also heated to normal operating temperature. During the same period, with the same degree of oil agitation, the immersed part of the plate was rinsed clean of sludge.

Simple test shows how

SUNVIS 700 OILS CLEAN HYDRAULIC SYSTEMS... WITHOUT SHUTDOWNS

Sunvis* 700 oils clean while they work. Their cleansing action removes deposits in systems contaminated by dust, sludge, varnish, and other foreign materials.

SUNVIS 700 oils carry these contaminants in suspension for easy removal. This eliminates costly teardowns. Systems stay clean. In addition to being ideal for hydraulic systems,

SUNVIS 700 oils are also suited for circulating systems and gear boxes.

If you want exceptional cleaning ability, oxidation stability, rust prevention, film strength, you need SUNVIS 700 oils. Ask your Sun representative for full details, or write to **SUN OIL COMPANY**, Philadelphia 3, Pa., Dept. IA-1.

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY Philadelphia 3, Pa.

IN CANADA: SUN OIL COMPANY LIMITED, TORONTO AND MONTREAL



*TRADEMARK © SUN OIL COMPANY 1958

December Was a Good Month

But Builders Aren't Sure It Will Continue

The worst year since 1949 wound up with a net new order increase in December.

But builders are staying cautious in their market appraisal until January figures are in.—By E. J. Egan, Jr.

Net new orders for U. S.-built machine tools jumped sharply in December. It was the best month for builders in anything-but-prosperous 1958.

The National Machine Tool Builders' Assn. estimates December's net new orders for metal cutting machines at \$30.2 million. In the same month, builders of metal forming machines racked up \$12.8 million in net new bookings.

End of a Tough Year—Total net new orders for the year just ended probably hit just under \$375 million. The industry hasn't had a rougher 12 months for garnering new business since 1949.

Builders still aren't willing to predict what will happen this year. The December spurt wasn't enough to uncross many fingers.

January Will Tell—If new orders this month match or outreach the December figures, a few will concede a better-business trend might be starting. But it will be another three weeks before the January picture is clear. Until then, "cautious optimism" is the watch word.

What Automakers Want

Standardized, building-block machine tools for the automotive industry moved a step closer this

month. At a series of meetings in Detroit, machining experts from Ford, General Motors, Chrysler, and International Harvester made specific recommendations to 27 builders of special machine tools.

The automotive concerns want more flexibility in their in-line transfer machines, rotary-index dial machines, and way-type machines, both horizontal and vertical. Their recommendations aim at a uniform work-loading height, and standard dimensions and ways of mounting or attaching wing bases and power units to main bases.

What's Been Done—The meet-

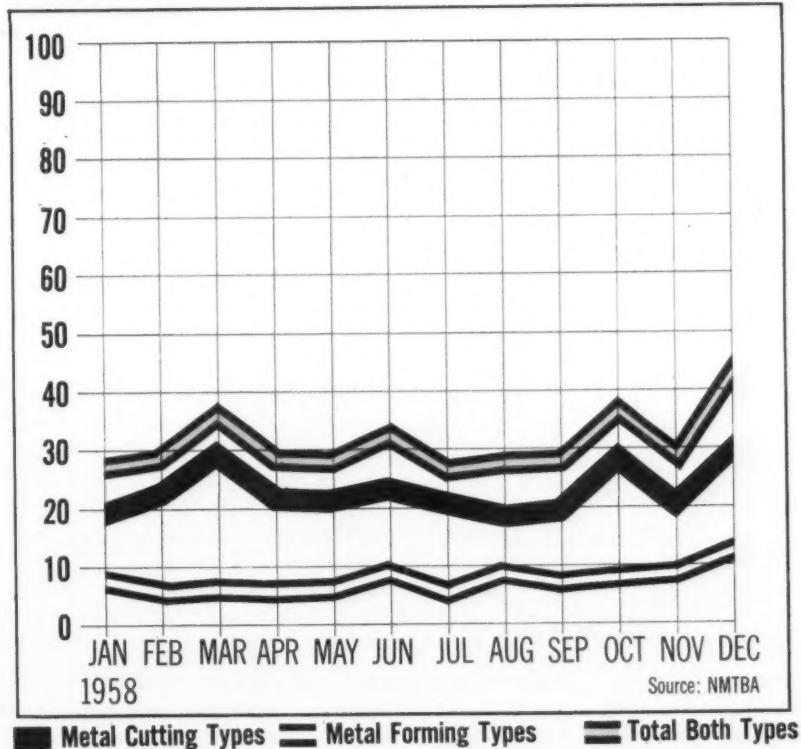
ings were exploratory. Builders and users exchanged views. Yet, some areas of disagreement were resolved. Ford spokesmen called the sessions "positive," since discussions were confined to standards that can be worked out rather quickly.

Auto representatives were pleased at the cooperative attitude builders showed throughout the conference. John Q. Holmes, General Motors' standards coordinator, said the sessions produced "frank and honest appraisal of one another's problems . . . a better understanding of what needs to be done."

MACHINE TOOLS-NET NEW ORDERS

In Millions of Dollars

Metal Cutting and Forming Types



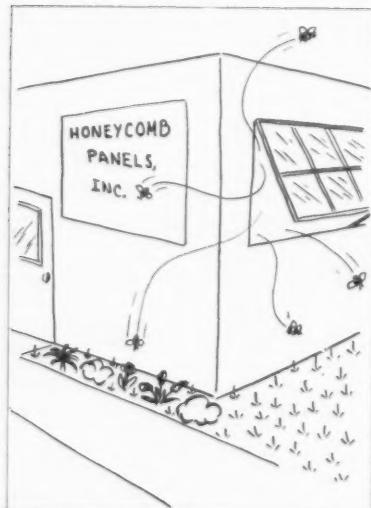
INDUSTRIAL BRIEFS

Above and Beyond the Call—R. B. Shaw, general superintendent, melting operations, Brackenridge, Pa., Works, Allegheny Ludlum Steel Corp., received the company's highest recognition for achievement, the Allegheny Ludlum Award and President's Medal. Mr. Shaw was cited for his outstanding contribution to the development of low-cost, high quality silicon and stainless steel melting.

Bethlehem Buy—Bethlehem Pacific Coast Steel Corp. has purchased the 200,000 sq ft Vernon, Calif., plant of U. S. Industries, Inc. The price was in excess of \$1 million. This amount will be paid out over three years, the period of time USI will take to vacate the plant.

Porter Courts National—H. K. Porter Co., Inc., and National Electric Products Corp. are looking toward a possible agreement and plan of organization, whereby National Electric will transfer substantially all of its assets, subject to liabilities, to H. K. Porter Co.

Flat Statement—A process of annealing by a continuous strip to produce electrical steel sheets with a high degree of flatness has been developed by Westinghouse Electric Corp.'s transformer division.



Alloy for Missiles—Jones & Laughlin Steel Corp. plans to introduce a new stainless steel alloy with applications in the field of aircraft and missiles. The new alloy contains a modification of nickel content which promises to make it applicable for scores of new uses. The development was revealed by M. K. Schnurr, president, J&L's Stainless & Strip Div.

Oxygen for Gary—A second plant, capable of producing 94 million cu ft of oxygen per month, will be built, owned and operated by Linde Co., Div. of Union Carbide Corp., on property leased from U. S. Steel at the Gary Works, as is the present plant. It will double Linde's capacity to supply oxygen requirements at Gary. The new plant will produce 256 million cu ft per month of high-purity dry nitrogen.

New Control Lab—The Carpenten Steel Co.'s new metallurgical control lab has been put into operation to provide faster service in the production of testing of steels to customer specifications. The new facility also houses offices for the annealing and wire mill superintendents.

Off and Running—Full-scale manufacturing operations are underway in the new extension added to General Electric Co.'s Medium Steam Turbine, Generator and Gear Dept., Lynn, Mass. The new manufacturing building is part of the \$23 million expansion and modernization program started by the department in May 1956 and which will be completed in 1961.

Sales and Service—I-T-E Circuit Breaker Co., Philadelphia, will open a combination district sales office, warehouse and service center which will be housed in a \$300,000 building now under construction in S. San Francisco's Lindenville Industrial Park.

Liquid Situation—Linde Co., Div. of Union Carbide Corp., shipped industrial gas producing equipment to the company's new

multi-million dollar plant near Pittsburg, Calif. Upon completion in 1960, the Pittsburg plant will produce 300 tons of liquid oxygen and nitrogen per day and serve a nine-state area of the west.

Powell Goes South—The Powell Pressed Steel Co., Hubbard, O., has acquired a Semi-Bulk Handling system from Delta Tank Mfg. Co., Inc., Baton Rouge, La. The system is a new method for the handling, storage and shipment of chemicals, grains, plastic pellets, foods and other dry granular products.

Good Reception—I-T-E Circuit Breaker Co.'s Special Products Div. has received a contract for about \$5 million for all antennas of a new military communications system in NATO countries in Europe. The contract was awarded to I-T-E by SHAPE, the military arm of NATO, to cover designing, building, and installing of all antennas.

New Prexy—H. E. Dever, vice president, Minneapolis - Honeywell Regulator Co. and president of its Brown Instruments Div., has been elected president of the Metal Manufacturers' Assn. of Philadelphia. Mr. Dever is a former two-time president of the Scientific Apparatus Makers' Assn.

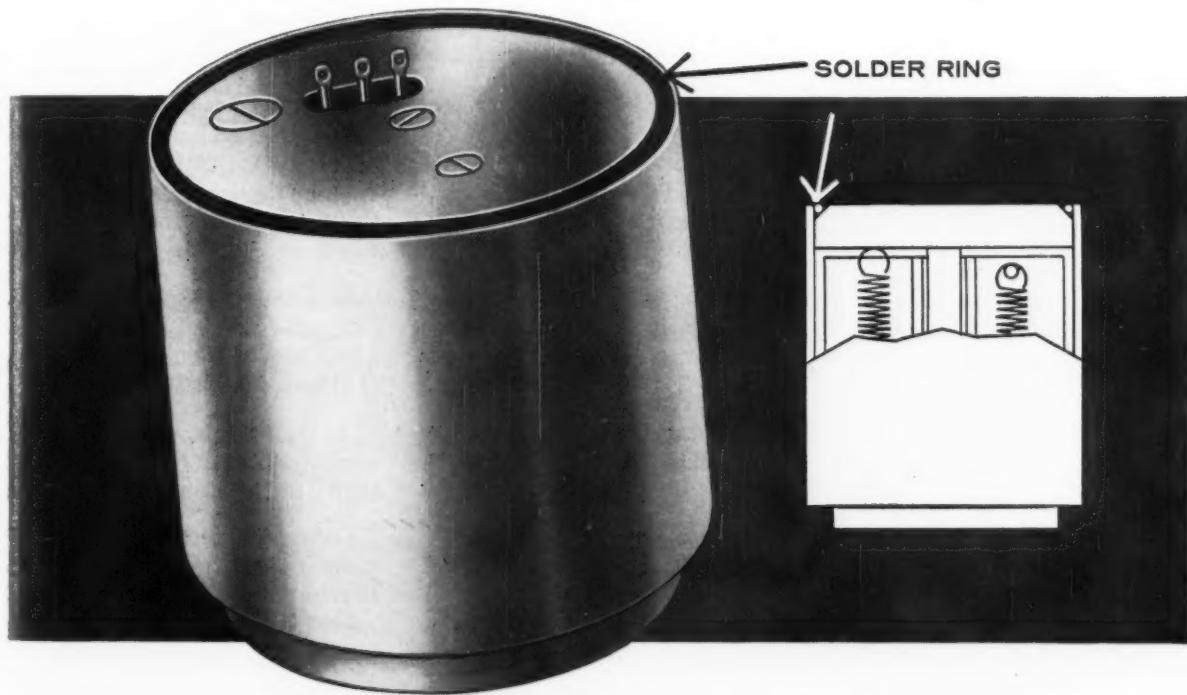
How's That?—The M-S-A Noise-foe Mark II, incorporating a new type protective ear cup has been developed through a research and development program of Radio Corp. of America and Mine Safety Appliances Co. Weighing less than 10 oz., the new ear protectors are available with receivers and microphones.

Vat 90—The Hauser-Stander Tank Co., of Cincinnati, is in its 90th year of building wood pickling tanks for steel mills and metal fabricators. It is a specialist in the production of heavy tanks made of six, eight, ten, and twelve inch thick timbers.



Precision soldering 7 Times Faster...

with **TOCCO*** *Induction Heating*



When G. M. Giannini and Co., Inc., Pasadena, California, switched from old-fashioned methods to TOCCO Induction Heating they increased production of these high-precision accelerometers from 4 to 30 per hour—with a commensurate *decrease* in production costs.

Here's what a Giannini official has to say about the TOCCO installation: "Prior to using TOCCO for this purpose, we had tried soldering irons, normal torches, resistance sealing, and even threaded screw fittings, with uniformly poor results. Essentially, the TOCCO unit has permitted us to build, in production quantities, oil-filled hermetically sealed units that could not be produced in any other way."

Whether your production bottleneck involves soldering, brazing, heat treating or heating for forming it

pays you to investigate TOCCO as an economical way to do it better, faster and at lower cost.



THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today—**NEW FREE Bulletin**

The Ohio Crankshaft Co. • Dept. A-1, Cleveland 5, Ohio

Please send copy of "Typical Results of TOCCO Induction Brazeing and Soldering".

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City _____ Zone _____ State _____

MEN IN METALWORKING



O. M. Bundy, named manager, New Products Div., Clark Controller Co., Cleveland.

J. L. Block, will become chairman and remain chief executive officer, Inland Steel Co., Chicago; **P. D. Block, Jr.**, elected vice chairman; **J. F. Smith, Jr.**, elected president; **H. W. Johnson**, elected vice president, planning and research; **F. M. Rich**, becomes vice president, steel manufacturing; **R. M. Buddington**, elected vice president, sales; **L. B. Hunter**, elected vice president, administration; **C. B. Jacobs**, named vice president, raw materials.



T. H. Hagan, appointed asst. district manager, Southern Steel District, Republic Steel Corp., Gadsden, Ala.

A. T. Blackburn, elected vice president, Cincinnati Milling Machine Co.

A. M. Cole, appointed executive vice president, Reynolds Aluminum Service Corp., Richmond, Va., a Reynolds Metals subsidiary.

R. L. Mullen, elected president and chief executive officer, Lehigh Structural Steel Co., Allentown, Pa.; **G. J. Neumann**, elected executive vice president.

J. B. Hunley, appointed superintendent, labor and transportation, Buffalo steel plant, Republic Steel Corp.; **T. F. Woods**, promoted to asst. superintendent, labor and transportation.

H. F. Carver, named asst. general manager, Gleason Works, Rochester, N. Y.

E. L. Pulaski, appointed chief works metallurgist, West Leechburg Works, Allegheny Ludlum Steel Corp., Pittsburgh.

H. C. Soukup, appointed general manager and **E. F. Woytich**, becomes works manager, Fond du Lac Div., Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.



R. H. Henke, appointed asst. manager, Central Alloy District (Canton and Massillon, O.), Republic Steel Corp.



A. J. Malisek, named director, purchases, Bridgeport Brass Co., Bridgeport, Conn.

L. N. Schuman, becomes head, Product Engineering Dept. of the Industrial Div., National Malleable & Steel Castings Co., Cleveland; **Charles Schneider**, named general superintendent, Cleveland Works.

Dr. Sidney Siggi, appointed manager, central analytical services, New Haven, Conn., Olin Mathieson Chemical Corp.

A. R. Baldwin, named general sales representative Republic Steel Corp., Birmingham, Ala.

Following appointments are within the Bolt and Nut Sales Div. of Republic Steel Corp. **R. E. Wagner**, appointed asst. general manager, sales; **J. W. Lyons**, promoted to



S. C. Killian, appointed vice president and general manager, Delta-Star Electric Div., H. K. Porter Co., Inc., Chicago.



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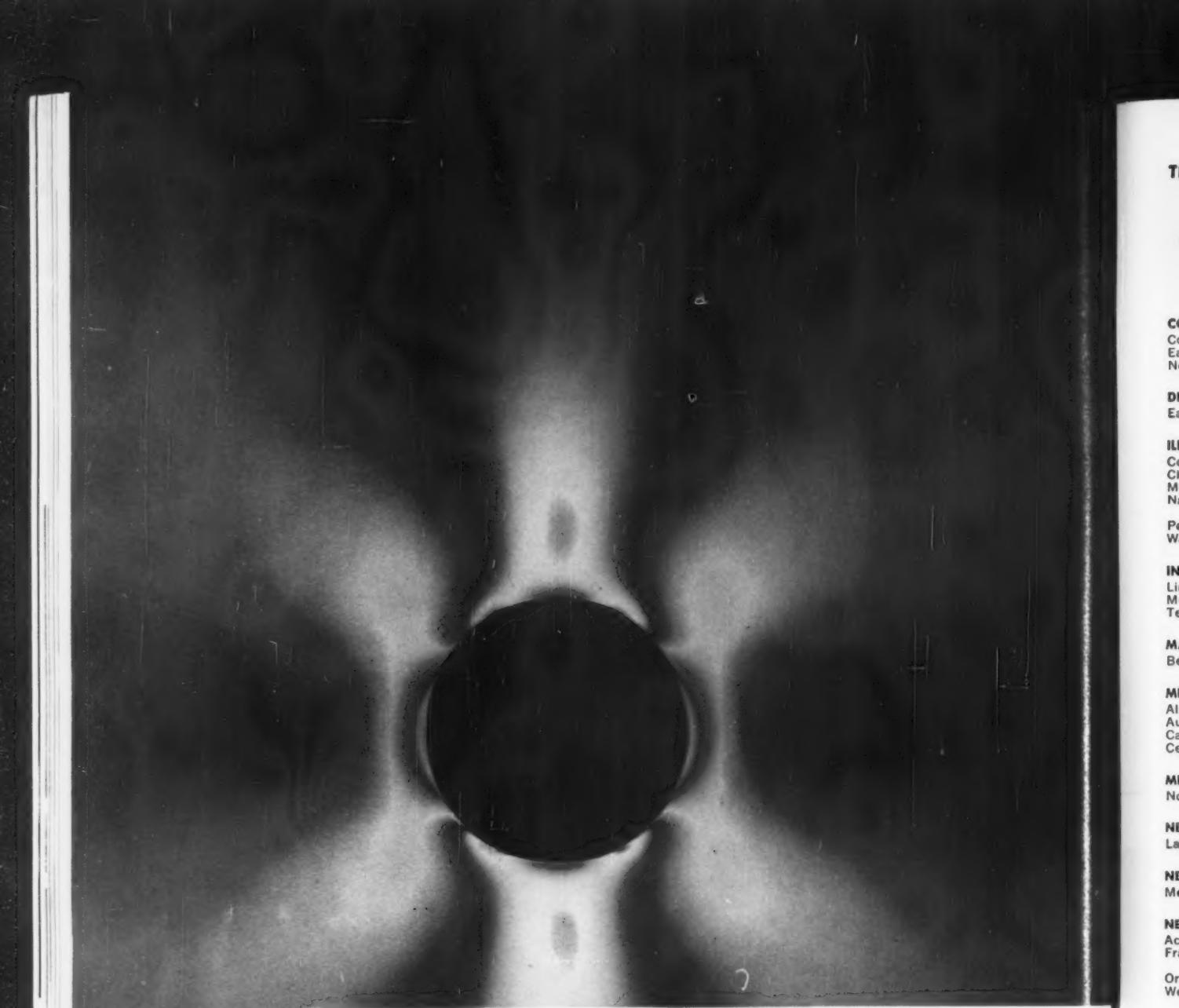


Photo-elastic stress patterns produced by models photographed with polarized light are one of the modern analytic tools available for ever-increasing perfection of Malleable iron castings.

Strength is Malleable

The strength crucial in spiraling the heave of diesels' pistons into unresistible power, in protecting lives as automobiles hurtle down endless highways, and in every link of chain that swings massive loads overhead, is yours to mold into tomorrow's dynamic engineering achievements with Malleable iron castings. Yet Malleable provides this strength in combination with toughness, producibility and economy that makes Malleable castings the finest, most versatile metal available.

For information or service, call on one of the progressive firms that identify themselves with this symbol—

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If you wish, you may inquire direct to the Malleable Castings Council, 1800 Union Commerce Building, Cleveland 14, Ohio, for information.

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Eastern Malleable Iron Co., Naugatuck
New Haven Malleable Iron Co., New Haven 4

DELAWARE

Eastern Malleable Iron Co., Wilmington 99

ILLINOIS

Central Fdry. Div., Gen. Motors, Danville
Chicago Malleable Castings Co., Chicago 43
Moline Malleable Iron Co., St. Charles
National Mall. and Steel Castings Co.,
Cicero 50
Peoria Malleable Castings Co., Peoria 1
Wagner Castings Company, Decatur

INDIANA

Link-Belt Company, Indianapolis 6
Muncie Malleable Foundry Co., Muncie
Terre Haute Mall. & Mfg. Corp., Terre Haute

MASSACHUSETTS

Belcher Malleable Iron Co., Easton

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Albion Malleable Iron Co., Albion
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Laconia Malleable Iron Co., Laconia

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Meeker Foundry Company, Newark 4

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Frazer & Jones Company Division
Eastern Malleable Iron Co., Solvay
Oriskany Malleable Iron Co., Inc., Oriskany
Westmoreland Mall. Iron Co., Westmoreland

OHIO

American Malleable Castings Co., Marion
Canton Malleable Iron Co., Canton 5
Central Fdry. Div., Gen. Motors, Defiance
Dayton Mall. Iron Co., Ironton Div., Ironton
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Columbus 16
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Erie Malleable Iron Co., Erie
Lancaster Malleable Castings Co., Lancaster
Lehigh Foundries Company, Easton
Meadville Malleable Iron Co., Meadville
Pennsylvania Malleable Iron Corp., Lancaster

TEXAS

Texas Foundries, Inc., Lufkin

WEST VIRGINIA

West Virginia Mall. Iron Co., Point Pleasant

WISCONSIN

Badger Malleable & Mfg. Co., S. Milwaukee
Belle City Malleable Iron Co., Racine
Chain Belt Company, Milwaukee 1
Federal Malleable Company, West Allis 14
Kirsh Foundry Inc., Beaver Dam
Lakeside Malleable Castings Co., Racine
Milwaukee Malleable & Grey Iron Works,
Milwaukee 46

How to Get More Strength Per Dollar with Malleable Castings

With few exceptions, strength is the most important single design requirement for a metal part. But in the commercial production of that part, the ultimate objective is to manufacture it

at the lowest possible cost. Malleable iron castings take advantage of many factors to provide the greatest strength per dollar of any ferrous or non-ferrous metal.

Great Strength Range Available

From the wide range of standard (ferritic) and pearlitic Malleable irons available, a type may be selected that meets strength requirements ranging from 50,000 p. s. i. to 120,000 p. s. i. tensile.

Table No. 1 shows these strength values and other physical measures for 9 grades of Malleable. Note particularly how high yield strengths are in comparison to tensile strengths. Because yield strength is generally the measure of usable strength, this is especially important.

Also important is the uniformity of Malleable's strength. The heat treatment given all Malleable castings produces a unique metallurgical combination of strength, ductility, machinability and impact resistance. At the same time, it relieves internal stresses so that Malleable

able's strength cannot be machined away, nor will it be present in some parts but missing in others.

TABLE No. 1
TENSILE PROPERTIES—
A.S.T.M. MINIMUM SPECIFICATIONS

Standard and Pearlitic Malleable Irons	Designation	Tensile Strength p. s. i.	Yield Strength p. s. i.	Ratio of Tensile Strength to Yield %
Standard	35018	53,000	35,000	66
	32510	50,000	32,500	65
Pearlitic	45010	65,000	45,000	69
	45007	68,000	45,000	66
	48004	70,000	48,000	69
	50007	75,000	50,000	67
	53004	80,000	53,000	66
	60003	80,000	60,000	75
	80002	100,000	80,000	80

Strengths up to 135,000 p.s.i. tensile and 110,000 p.s.i. yield are produced commercially under individual producers' specifications.

Economy Due to Multiple Factors

Malleable's superior strength-cost ratio is due to a combination of the casting process, which puts the metal where you want it, and the inherent economy of Malleable iron. Also, whenever machining operations are involved, Malleable

castings cut finished costs significantly. Being the most easily machined of all ferrous metals of similar hardness, the cost of the finished part can often be reduced to less than that of metals which cost less in the semi-finished stage.

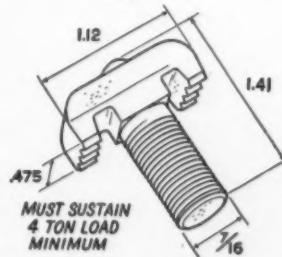
Malleable Provides Strength Plus Other Advantages

The T-bolt shown in Fig. 1 is used to assemble steel channel frames. Small but mighty, these 7/16" bolts hold 4 ton loads. The tensile strength requirements are 90,000 to 100,000 p. s. i., yet ductility must be good and tolerances must be held to $\pm .005$ " on the head width, and $+.020$ ", $-.000$ " on the inside of the head.

In this application, pearlitic Malleable castings proved the only material consistently capable of sustaining loads over 8,000 pounds and meeting close tolerances in critical areas. At the same time, sufficient ductility was maintained to allow upsetting the spring retainer protrusion on the head.

The finished Malleable castings cost one third less than the next most satisfactory material. For both dynamic and static applications, today's Malleable castings are truly one of industry's finest engineering materials.

Fig. No. 1



Write for Free Data Unit

Data Unit 102-Strength, more fully describing Malleable's strength characteristics, is available for use by materials specifiers and users. For your copy, contact any member of the Malleable Castings Council or write to Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio.

manager, automotive sales; **H. E. Frazier**, named manager, sales of consumer products.

S. D. Greiner, promoted to asst. product manager, motor-driven compressor sales, The Cooper-Bessemer Corp., Mount Vernon, O.



J. H. Daley, named sales manager, Machine Tool Div., Pratt & Whitney Co., Inc., West Hartford, Conn.

F. R. Stryke, appointed comptroller, Midvale-Heppenstall Co., Nicetown, Pa.

H. M. Graff, appointed general manager, raw materials, Inland Steel Co.

M. E. Young, appointed assistant to the sales manager, Western Div., Titan Metal Mfg. Co., Newark, Calif.

E. M. Spadafore, appointed asst. plant manager; **V. J. Dobos**, named wire mill superintendent; **L. R. Wetzel**, appointed superintendent, Coating and Heat Treating Dept., Page Steel & Wire Div., American Chain & Cable Co., Inc., Monessen, Pa.

Dr. A. B. Backensto, Jr., appointed research metallurgist, Alan Wood Steel Co., Conshohocken, Pa.

G. A. Faber, appointed ground services manager, United Air Lines at Columbus, O.



G. J. Pruitt, appointed purchasing agent, Stran-Steel Corp., Div. of National Steel Corp.

D. B. Hull, appointed Cleveland district sales manager, Bolt and Nut Div., Republic Steel Corp.

T. M. Adgate, becomes asst. spring engineering manager, Wallace Barnes Div., Associated Spring Corp., Bristol, Conn.; **R. G. Wil-**

CROSS-BAY[®] TRANSFER CARS
ELECTRIC, DIESEL-ELECTRIC, GAS-ELECTRIC, G...

A large advertisement for EASTON Cross-Bay Transfer Cars. The top half features a man in a white shirt and tie standing next to a long, dark-colored transfer car on a track. The car has a distinctive curved, 'bay' shape. The text 'CROSS-BAY[®] TRANSFER CARS' is prominently displayed in large, bold letters, with 'ELECTRIC, DIESEL-ELECTRIC, GAS-ELECTRIC' in smaller letters below it. The bottom half of the ad shows a detailed technical drawing of the transfer car's internal structure, including its tracks, superstructure, and overhead cranes. The word 'EASTON' is printed on the side of the car.

EASTON

EASTON Cross-Bay* Transfer Cars

supplement the service of overhead cranes in multiple-bay plants by providing low-cost handling across the bays and between plant buildings. Also available with custom-designed superstructure for specialized handling operations.

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cox, named steel production manager; **V. J. Radaskiewicz**, named general foreman, Flat-Coil Dept.

H. F. McCloy, appointed director, Real Estate Div., U. S. Steel Corp.

T. F. Naylor, appointed sales manager, Metal Products Div., Koppers Co., Inc., Baltimore, Md.



F. G. Jaicks, appointed general manager, Indiana Harbor Works, Inland Steel Co., E. Chicago.

R. W. Hiller, appointed assistant to general manager, Engineering Works Div., Dravo Corp., Pittsburgh.

E. L. Ogden, appointed manager, labor relations, The Babcock & Wilcox Co., New York.

J. W. Banks, appointed superintendent, blast furnaces, Indiana Harbor Works, The Youngstown Sheet & Tube Co., E. Chicago, Ind.

F. S. Patton, appointed chief drainage products engineer and **C. L. Tracy**, Canton, O., district sales manager, Culvert Div., Republic Steel Corp.

G. E. Stults, appointed asst. manager, sales, Republic Steel Corp.'s Wire Div., with headquarters in Chicago.

R. E. Stidman, Jr., appointed Charlotte, N. C., district sales manager, Culvert Div., Republic Steel Corp.



E. F. Shelley, elected president, USI Robodyne, division of U. S. Industries, Inc.

N. K. Helding, appointed construction machinery sales manager, Syracuse, N. Y., branch, Allis-Chalmers Mfg. Co., Milwaukee.

R. S. Hayden, named special assistant to the vice president, finance, Armco Steel Corp., Mid-

CAPACITIES • 25 TO 650 TONS

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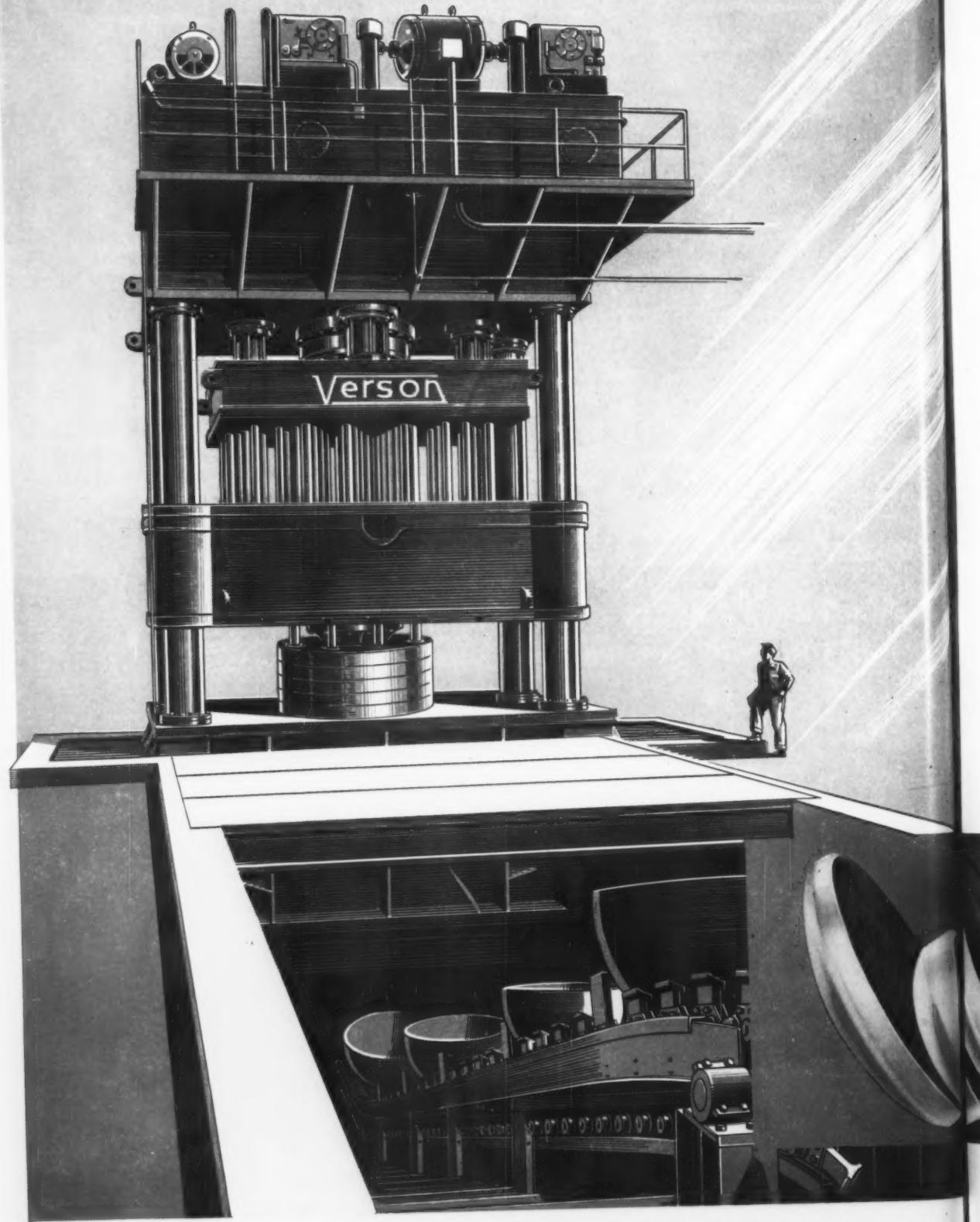
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CLAYMONT can handle



large quantity head orders -and DELIVER ON TIME!

Claymont is uniquely well-equipped to handle the really big jobs quickly. We have a 3000-ton press to do the job.

SIZES AND SHAPES? This big press can form heads up to 120 inches in diameter. And our recently installed furnaces have increased our maximum gauge capacity to as high as 4 inches on certain sizes of heads.

Naturally, press dies have to be changed every time we change head diameter or shape. Claymont now has on hand a number of dies of different sizes in flanged and dished, hemispherical and elliptical shapes. Perhaps you can use one of these sizes or shapes. If so, you'll get faster delivery on your head orders than you've ever experienced.

METALS? Besides carbon, alloy, stainless and stainless-clad steels, Claymont regularly forms heads from aluminum, brass, bronze, copper,

nickel, Inconel and Monel metals.

QUALITY? Claymont head quality is second to none. Here's one example that we think speaks for itself: when a 123" two-piece conical head was ordered by one of Claymont's regular customers, they asked that the weld be marked—because it had been impossible to detect the weld location on a previous order.

NEED ONLY A FEW HEADS? Claymont is still one of your best sources. We will continue to produce small orders in a variety of sizes on all our forming equipment... the 3000-ton press, the recently modernized 1600-ton press, and the spinning machines with capacities up to nineteen feet. What's more, we maintain head stocks in many popular sizes and shapes for immediate delivery. Whether your order is large or small, we'd like to discuss your requirements with you. Just contact our nearest sales office.

5057

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Alloy Steel Plates • Stainless-Clad Plates • Clay-Loy® High Strength Low Alloy Steel Plates
Large Diameter Welded Steel Pipe • Fabricated Steel Parts • Manhole Fittings and Covers

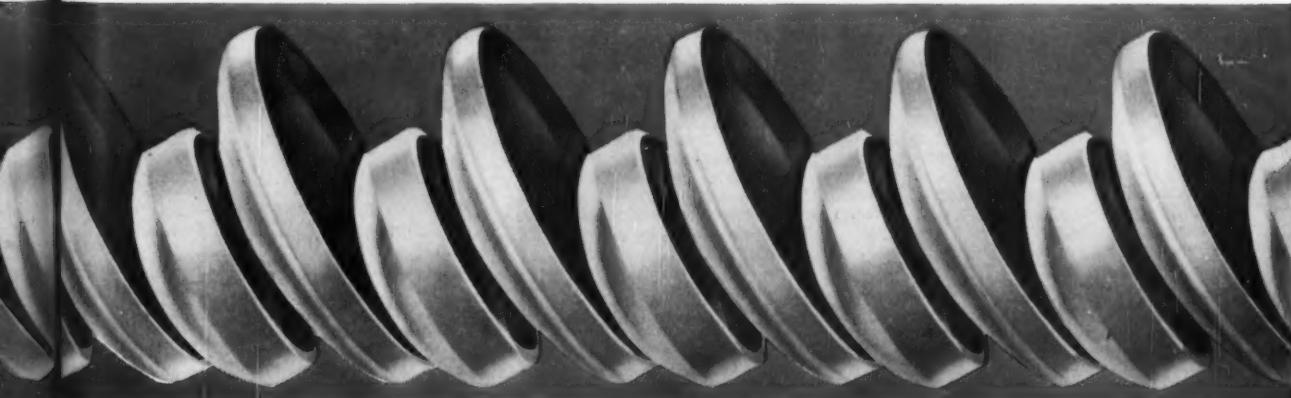


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CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg



dletown, O.; **C. H. Woodhouse**, named assistant treasurer and manager, corporate insurance.

W. B. Ilko, appointed sales manager, Wright Hoist Div., York, Pa., American Chain & Cable Co., Inc.

S. B. Reynolds, named service manager, Stanley Electric Tools, a division of The Stanley Works, New Britain, Conn.

W. R. Trimbur, named asst. district industrial engineer, Youngstown, O., steel plant, Republic Steel Corp.

Phillip Erhard, appointed purchasing agent, Crucible Steel Co.'s Sanderson-Halcomb Works, Syracuse, N. Y.

S. G. Kochis, named a roll sales engineer, East Chicago Works, Blaw-Knox Co., Pittsburgh.

W. B. Green, appointed sales representative, Techline Div., Wheelabrator Corp., Vicksburg, Mich.

W. H. Ceckler, appointed a chemical engineer, Jones & Laughlin Steel Corp., Pittsburgh.

Richard Doughton, Jr., appointed supervisor, product development, Stainless and Strip Div., Detroit, Jones & Laughlin Steel Corp.

A. F. Morris, Jr., appointed sales manager, The Morgan Engineering Co., Alliance, O.

J. H. Dodge, named sales manager, specialty steel, Latrobe Steel Co., Latrobe, Pa.

J. F. Hartford, appointed asst. works manager, Kropp Forge Co., Chicago.

F. J. Greenleaf, appointed purchasing agent, The Bristol Brass Corp., Bristol, Conn.; **Edward Montella**, named asst. purchasing agent.

R. D. Everett, named general superintendent, Melrose Park Works, National Malleable & Steel Castings Co., Cleveland.

R. H. Wilson, appointed asst. manager, Foundry Div., American Hoist & Derrick Co., St. Paul, Minn.

J. M. Till, named production control manager, Montebello, Calif., plant, Western Design, a division of U. S. Industries, Inc.

W. R. Mogg, appointed sales manager, Spring Div., Crucible Steel Co. of America, Pittsburgh.

C. E. Ingelis, promoted to manager, manufacturing, Atkins Saw Div., Borg-Warner Corp.

OBITUARIES

L. D. Covich, 72, founder and president, Atlantic Steel & Trading Co., Boston, Mass.

Carl Oseland, 55, product engineer, Alloy Tube Div., The Carpenter Steel Co., Union, N. J.

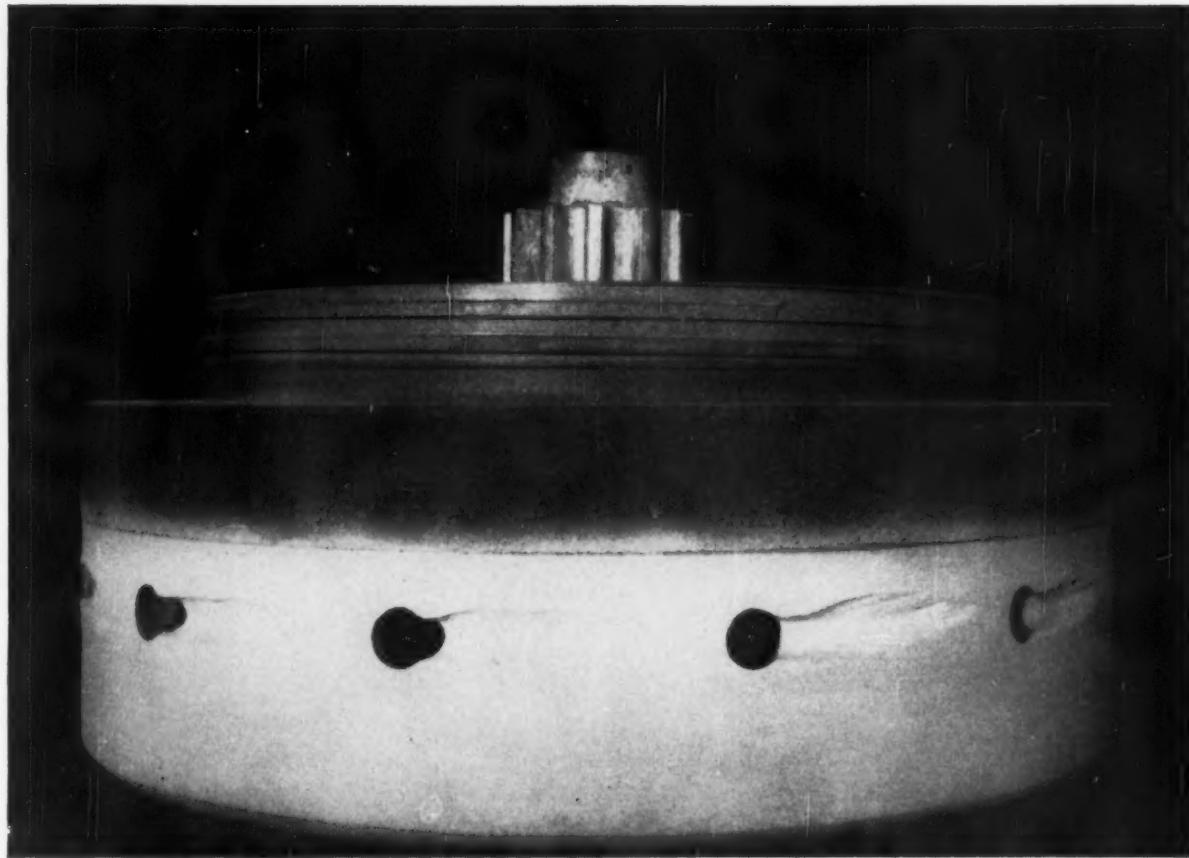
SRH... the dc rectifier type welder with new completely sealed semimetallic rectifier, new transformer and new weld stabilized circuit. Result is easiest arc starting ever; maximum arc stability; sounder, denser welds; current that handles all electrodes in all positions. Four models, 200 to 600 amps.

300... combination ac/dc welder design comes of age with this new Miller model. Features new magnetic amplifier circuit, improved wave form, new arc starting control; three electrically controlled current ranges for finest adjustment; instant changeover from ac to dc; built-in high frequency. An entirely fresh concept for inert gas and metallic welding. Four basic models with kits available to convert to seven different types of welders.

300-M... an ac welder for inert gas and metallic arc processes. Combines unequalled welding characteristics with Miller's unique electric control circuit which permits precise slow or fast start. Features: built-in high frequency, primary contactor and 1/2 KVA control transformer. Offered in three basic models of from 200 to 400 amperes with optional water and gas controls available.

Complete particulars on any of the above welders will be sent promptly.

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ELECTRIC MANUFACTURING COMPANY, INC. Appleton, Wisconsin
Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal, P. O.



The Georgia Kaolin Company, well-known manufacturer of industrial clays, reports that they have made substantial savings by coating worn separator centrifuge bowls with Norton ROKIDE "A" coating. Worn bowls were previously returned to their manufacturer after six to eight months of high speed service for restoring to their original

condition. But now Georgia Kaolin applies ROKIDE "A" coating before the bowls become badly worn . . . and at a fraction of repair cost at the factory. Service life is greatly extended. Maintenance costs and down time are substantially reduced.

How ROKIDE* Coatings increase service life, cut maintenance costs of moving parts



ROKIDE coatings are applied by heating the end of a ceramic rod and projecting the molten particles at high velocity. Reaching a prepared surface, they adhere and solidify. Protecting parts of a wide variety of sizes and shapes, these coatings are in extensive, rapidly increasing use in military and general industrial applications.

Three types of ROKIDE spray coatings — "A" aluminum oxide, "ZS" zirconium silicate and "Z" zirconium oxide — are hard, adherent, crystalline refractory materials. Parts, particularly metals, on which these coatings are especially useful are those requiring thermal or electrical insulation . . . resistance to wear or corrosion . . . excellent mechanical strength . . . dimensional stability . . . relative chemical inertness.

Possible applications: bearing surfaces, metal rolls, feed rolls, nozzles, pump shafts, thermocouple tubes and wire, mechanical seals, extrusion dies, laboratory molybdenum boats, vibratory feed hoppers, metal guides, metal melting pots, sanding fixtures, induction heating coils,

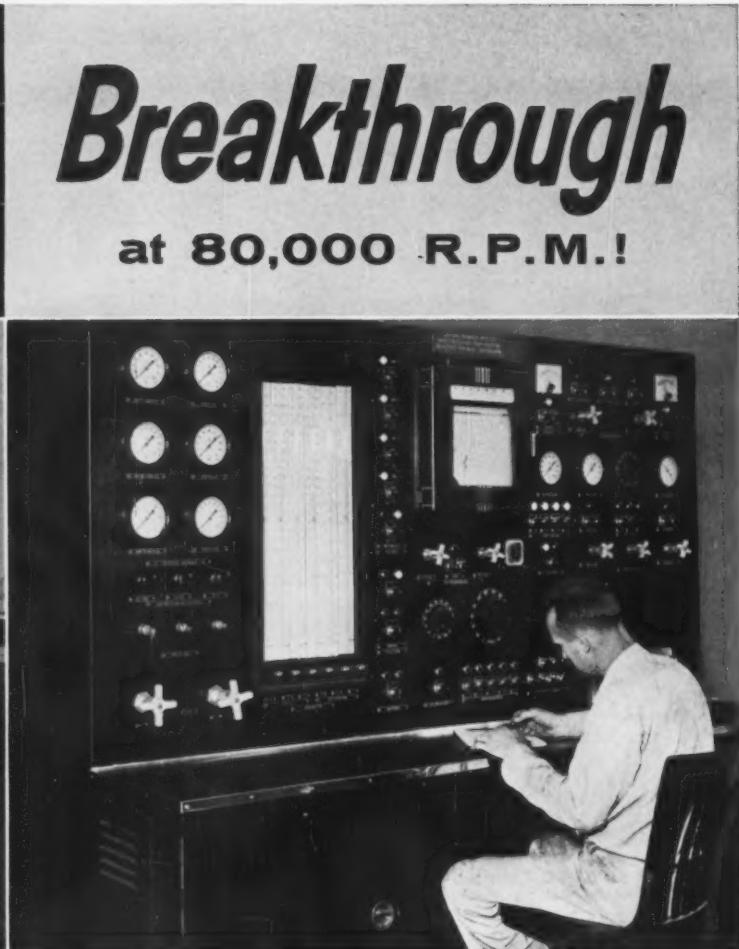
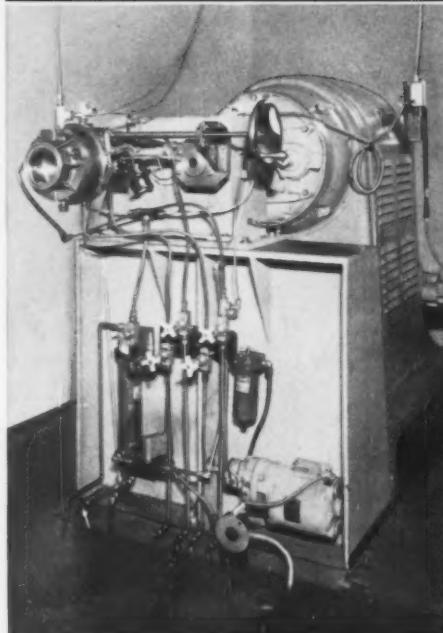
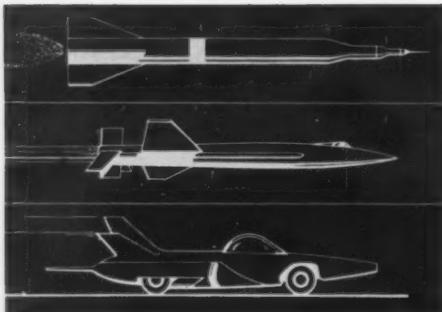
strain gages, and applications in the wire industry.

Norton maintains facilities for applying ROKIDE coatings at Worcester, Mass., and at its plant 2555 Lafayette Street, Santa Clara, California. For further facts, write to NORTON COMPANY, New Products Department, 200 New Bond Street, Worcester 6, Massachusetts.

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New C/R high-speed laboratories ... testing seals at tomorrow's speeds!

Pushing a design program through on schedule means that there can be no slow-down in any phase. If you know there's a high-speed sealing problem ahead — an accessory drive for a new jet, a hot, fast-rotating shaft in a guided missile, or a bearing in tomorrow's turbine car — plan for it now. Here in Chicago Rawhide's new High-Speed Seal Test Laboratory, C/R engineers now are breaking through present limits, evaluating the design and performance of advanced seal types such as

end face, controlled gap, bellows, segmental and bore type seals under such punishing conditions as 80,000 R.P.M., -300° to +1000° F. and 500 psi. C/R is at your service now with the most advanced technology and facilities in the country for cooperative research on high-speed sealing problems.

Chicago Rawhide consistently gears itself to the future, ready to meet industry's new problems as they develop today. May we help you?

*More automobiles, farm and industrial machines rely on C/R Oil Seals
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**CHICAGO
RAWHIDE**



PROBLEM SOLVER: Spray brazing proved the only practical way to make this compact heat exchanger.

Simple Spray-Brazing Process Makes Tough Jobs Easy

By Harry E. Miller—Chief Mfg. Engineer, Coil Dept., Carrier Corp., Syracuse, N. Y.

Welding thin steel sections in hard-to-reach places is exasperating at best. Sometimes, it's almost impossible.

If that describes your problem, this spray-brazing technique might be the answer.

■ Even if you've never brazed anything in your plant, you should know about this newest variation of the technique.

It's called "powdered-nickel-spray brazing," and it might well solve some of those costly metal-

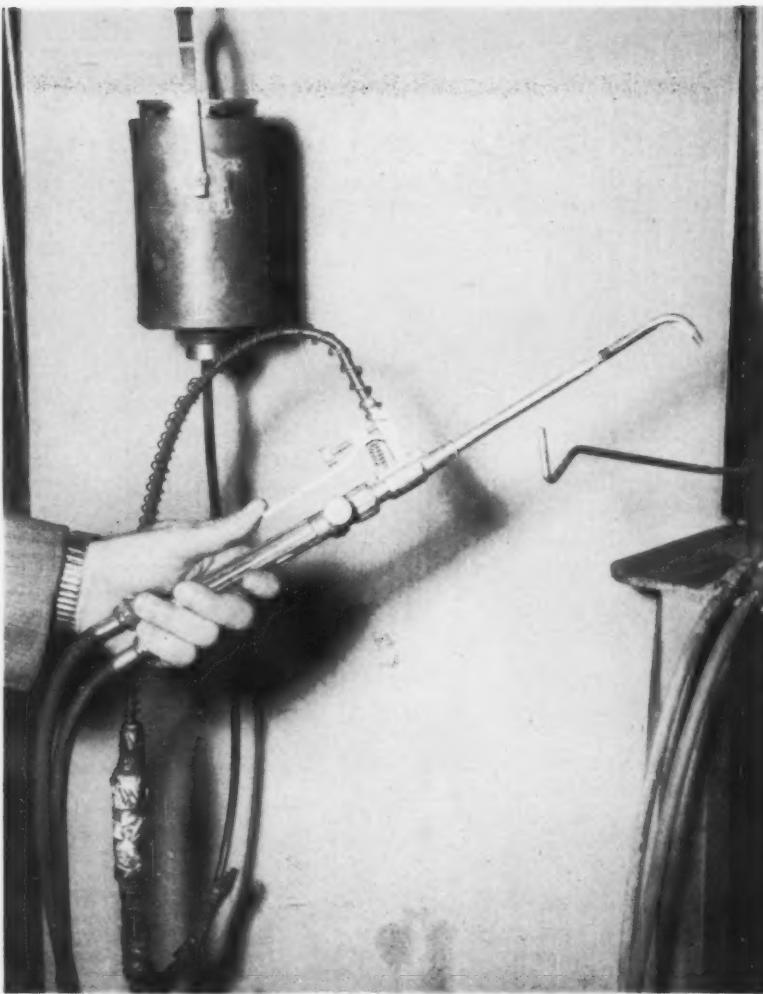
joining problems that have stumped you for years. Spray brazing doesn't need an expensive furnace setup. In fact, it could hardly be simpler or more economical.

All you need is an oxyacetylene hand torch, an overhead hopper full of a powdered nickel-silicon-boron alloy, and a rubber tube leading from the hopper to the torch. Turn on the torch and the rush of gas to the tip sucks the powdered brazing alloy into the flame. Result: The alloy melts in an easily-guided spray pattern.

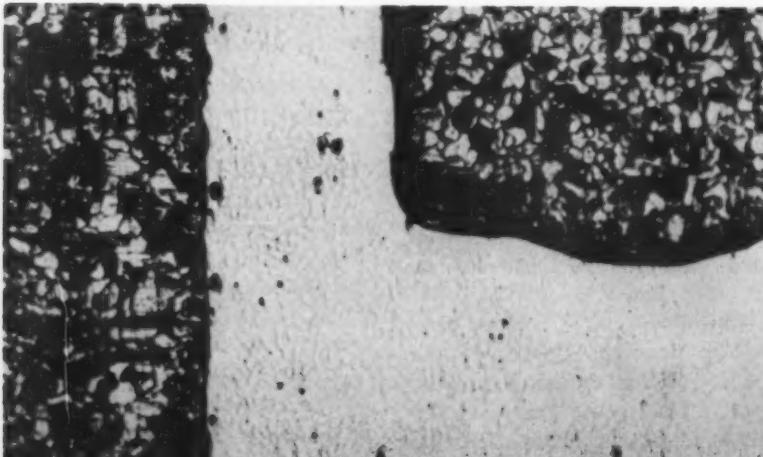
Opens Design Areas—Recently,

this technique opened the way for Carrier Corp. to make smaller, lighter, and more efficient heat exchangers for its refrigerating and air conditioning equipment. It allows the use of lighter gage steel, both for the tubular coil sections and the headers they're joined to. It also permits much closer coil spacing than ever before.

In the past, joining tubes and headers by arc welding was no problem for the company; both components had fairly heavy walls ($\frac{1}{8}$ in. for the $\frac{3}{4}$ -in. tubular coils; $\frac{1}{4}$ in. for the 4-in. diam headers). Moreover, tubes were widely spaced



SIMPLE SETUP: Powdered brazing alloy flows from overhead container through rubber tube to thumb-operated valve on oxyacetylene torch. Flow of gas aspirates powder through the one-piece tip and blowpipe.



CLEAN, TIGHT BOND: Spray-brazed joints show sharp boundaries between steel sections (dark areas) and the brazing alloy (light area). Porosity in the joint is negligible. The steel microstructure is normal.

on the headers (2½ in. between centers) in a triangular pattern.

Competition Sparks Action—But in recent years, marketing of air conditioning equipment grew more competitive. Design emphasis swung toward smaller, lighter, and more efficient units that could be made at lower cost.

Carrier engineers designed a new heat exchanger in line with this thinking. Its coils were formed from 5/8-in. diam steel (SAE 1020) tubes with walls only 0.065 in. thick. Header walls were thinned down to 1/8 in. Tube spacing on the triangular pattern was closed up to 1¼ in. between centers.

The new design was fine, but unlike the old one, it couldn't be fabricated easily by arc welding. It was impossible to weld leakproof joints consistently; either the light sections would burn through, or the many arc starts caused by trying to weld behind the closely-spaced tubes resulted in undercutting. With these handicaps, it took 2½ days to weld a model of the new design. The older, heavier exchangers could be welded in four hours.

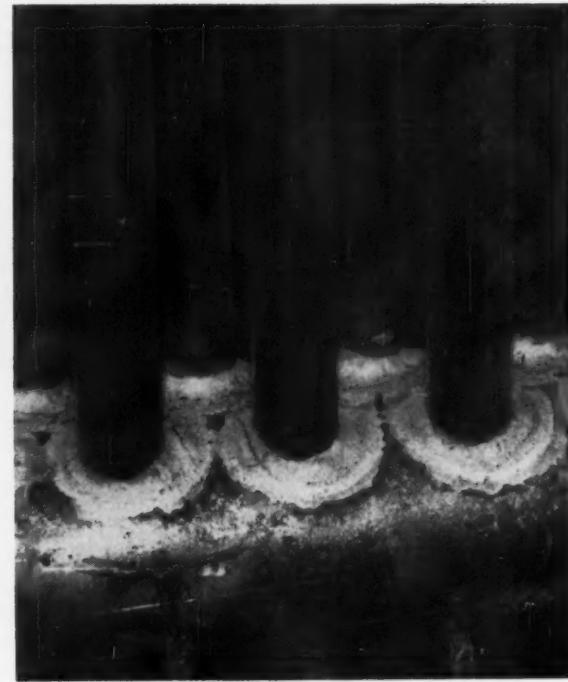
Tough Challenge—This prompted a search for other ways to fabricate the new unit. But there were problems here, too, which limited the choice of filler metals. To do the job, such a metal would have to (1) satisfy underwriter codes as to joint strength, (2) resist corrosion stemming from the use of ammonia gas as a refrigerant, and (3) remain unaffected by a hot dip galvanizing of the coil unit after it was fabricated.

A brazing material seemed most desirable, but the common silicon bronze or silver alloys would not satisfy conditions (2) and (3) in the above list.

Try Powder Alloy—At this point the company decided to try a Type 50 powdered nickel-silicon-boron brazing alloy made by Coast Metals Inc., Little Ferry, N. J. The alloy, which fits Aircraft Material Specification No. 4778, contains 93.25



OLD VS. NEW: Arc welding, as formerly done (left) on heavy-walled tubes and header, was a relatively



easy task. Joints in new, compact heat exchanger (right) cannot be welded, are neatly spray brazed instead.

pct Ni, 3.50 pct Si, and 1.90 pct B. Its flow point is 1930°F. Tested successfully with the hopper-fed oxyacetylene torch, it is now the standard material for brazing Carrier's heat exchangers.

This nickel-base alloy satisfies all three of the conditions listed above. Its capillary action makes it easy to braze even the most inaccessible joints. It produces smooth, even fillets without any undercutting. And despite the close spacing of tubes in the new exchanger design, consistently leakproof joints are brazed in the 4-hour standard time.

Properties Fit Job—The powder particles have a spherical form which means good flow characteristics and a minimum surface area to decrease oxidation. Dust content is very low.

The nickel base metal is preferable to iron because a low equilibrium ratio between hydrogen and water vapor, and between carbon monoxide and carbon dioxide will still reduce nickel oxide. The boron and silicon additions are particularly useful as they are self fluxing.

Oxides of these elements form the low melting gases and fluxes commonly used in brazing.

Workers use a standard, aircraft-type, oxyacetylene torch body to spray the nickel-base powder. Fixed amounts of gases and powder are metered for passage through a single-size, one-piece tip and blowpipe. Powder flow is controlled by a simple, thumb-operated, On-Off valve on the torch.

Overhead Supply—The powder supply for each torch is a 10-lb can of the material attached to an overhead cradle at the brazing station. Powder flows down through a rubber tube which connects the bottom of the can to the intake of the thumb-operated valve.

There is no question that the brazed tube-and-header joints are strong. Numerous bend tests testify to this. Nor is there any evidence of grain growth or other abnormalities in the steel adjacent to the sharply defined joint boundaries, as the accompanying photomicrograph proves.

Some slight porosity shows up in

a microscopic examination of these joints, but it is not in a continuous form. There have been no leakage problems to date, and none are expected.

Other Uses—Brazing of heat exchangers is not the only use for this torch-and-powdered-alloy technique. It is also applied widely to overlay work, where a sprayed-on surface is needed to resist corrosion, or to reduce frictional wear.

For example, the process is used successfully to (1) apply powdered nickel-silicon-boron alloy as a seating material for high pressure steam valves; (2) attach clips, bolts, and other hardware to prefabricated structures; (3) tangentially join and seal 0.020-in. thick, low-alloy steel tubing in fabricating the thrust chamber of a rocket.

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Sodium Improves Aluminum 356

By R. A. Zuech—Metallurgist, Rocketdyne Div., North American Aviation, Inc., Canoga Park, Calif.

If you're thinking of modifying 356 alloy aluminum castings with a sodium addition, here are helpful pointers to give you the best mechanical properties.

Above all, don't count on finding as much contained sodium in the castings as you added to the ladle.

■ Aluminum casting alloy 356 is well known and has many industrial uses. Almost all aircraft and missiles now in service or in design stages have several 356 alloy castings as part of their structure.

What makes 356 particularly attractive is its combination of high mechanical properties and excellent foundry characteristics. The alloy belongs to the aluminum-silicon-magnesium family and nominally contains about 7 pct Si and 0.30 pct Mg.

Even Better—Recent tests conducted by Rocketdyne Div., North American Aviation, Inc., Canoga Park, Calif., indicate that 356 can be made even better. A sodium

addition—just enough to modify the aluminum-silicon eutectic—results in improved mechanical properties and greater ductility.

Here's why. The microstructure of 356 alloy sand castings consists primarily of aluminum solid solution dendrites surrounded by aluminum-silicon eutectic. When the metal is not specially treated, the eutectic is made up of large, needle-shaped, silicon crystals that cause the structure to be relatively brittle.

Alters Structure—When controlled, small amounts of metallic sodium are added to the liquid 356, the microstructure changes considerably. The silicon crystals become very small and finely dispersed in the eutectic.

But the amount of sodium added is known to be critical. For example, an excess of sodium lowers the fluidity and causes excessive porosity. In combination, the result is lowered mechanical properties.

Basic Tests—To determine percentage limits for correct modification of sand castings, a 300-lb charge of 356 alloy containing no

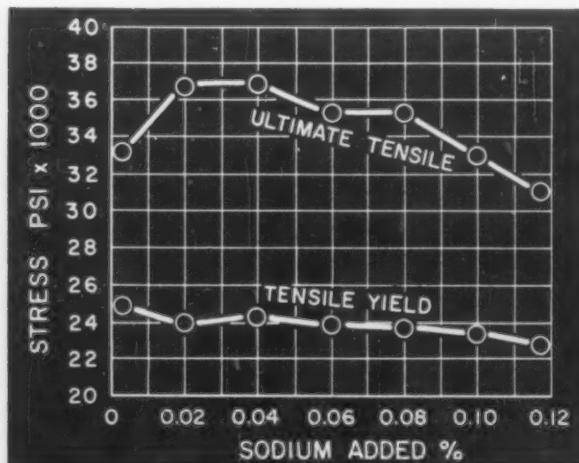
sodium was melted in a silicon-carbide crucible. Of prime interest were the effects of modification on both foundry characteristics and mechanical properties.

Two spiral fluidity test molds and one four-cavity tensile test bar mold were poured from the unmodified metal. A 35-lb capacity ladle was used. The pouring temperature for the test bar mold was 1280°F. The spiral molds were poured at 1240°F.

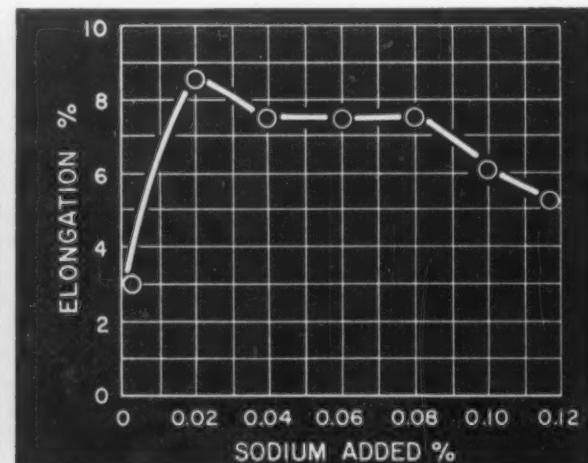
Add Sodium—Six additional pours of two spirals and one test bar mold for each pour were similarly obtained. Increasing amounts of sodium were added to successive ladles. To make the additions, sodium (wrapped in aluminum foil) was immersed in molten metal within the 35-lb capacity ladle.

For heat treatment, the test bars were held at 995°F for 14 hours. They were then quenched in hot (160°F) water. Quenching was followed by a 3-hour aging treatment at 310°F.

Checks Made—All test bars were radiographically inspected. In ad-



MECHANICAL PROPERTIES: Proper sodium addition enhances ultimate and yield strengths.



DUCTILITY: The ductility of the aluminum alloy is vastly improved by even minute additions of sodium.

How Various Additions Affect Key Properties

SODIUM %		YIELD STRENGTH PSI x 1000	ULTIMATE STRENGTH PSI x 1000	ELONGATION % IN 2"	HARDNESS R_E	POROSITY BY X-RAY	MACRO GRAIN SIZE
ADDED	ANALYZED						
NONE	NONE	24.5	32.3	3.0	81	SLIGHT	FINE
0.02	0.0028	23.8	36.2	8.5	77	MODERATE	FINE
0.04	0.0031	24.3	36.4	7.5	78	MODERATE	FINE
0.06	0.0033	23.8	35.4	7.5	77	MODERATE	FINE
0.08	0.0046	23.8	35.6	7.5	77	MODERATE	FINE
0.10	0.023	23.4	33.0	6.0	77	MOD. HEAVY	FINE
0.12	0.026	22.0	31.1	5.0	75	HEAVY	FINE

dition, a sample from each mold of test bars was examined metallographically in the as-cast and T6 (precipitation hardened) conditions. One test bar from each mold was macro-etched for grain size determination. The sodium content of each mold of test bars was measured by chemical analysis.

Sodium above that needed for proper modification caused a loss of properties. This is shown in the charts and the accompanying table. The loss does not become acute until the sodium content exceeds 0.004 pct.

Properties Change—Photomicrographs helped to point up the effects of sodium on microstructure. All samples with sodium in the range investigated had similar microstructures. Sodium above that required for modification did not further alter microstructure.

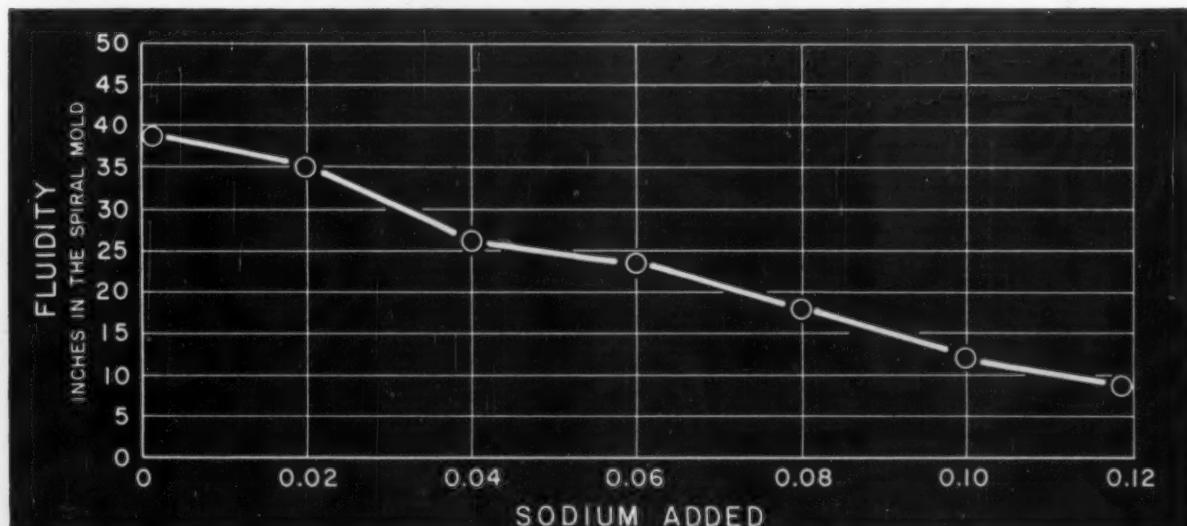
Loss in properties due to over-modification seemed to be caused only indirectly by a lowering of fluidity. But less fluidity did promote both shrinkage and gas porosity.

This theory was supported by the hardness values obtained. After

an initial drop due to refinement of the silicon crystals, hardness remained constant. If over-modification had a direct effect on mechanical properties, hardness could be expected to vary.

Big Difference—Results show a considerable difference between the amount of sodium added to the melt and the actual percentage found by analysis in the castings. This loss depends on melting practice. It will vary a good deal, depending on time, temperature, and use of fluxes.

Sodium's Influence on Fluidity



Scrap Preheater Cuts Costs In Electric-Arc Steelmaking

By R. J. Leary, Supervising Extractive Metallurgist, and
W. A. Philbrook, Consultant, Pyrometallurgical Lab., U. S. Bureau of Mines, Pittsburgh

A scrap preheater may cut electric-arc steelmaking costs by 22 pct or more.

What's more, it's likely to greatly reduce melting time, provide better carbon control.

■ On a dollars-and-cents basis, is it possible to bridge the gap between electric-arc furnace steelmaking and the openhearth? Normally,

the answer would have to be an emphatic "no." But an efficient preheater for electric furnace charges could alter that answer considerably.

Following conventional techniques, electric-arc steelmaking cannot compete economically with the openhearth in total energy costs. Several reliable surveys have shown the arc furnace at a marked disadvantage. Power and electrodes used

cost far more per ton of steel than equivalent energy from gas or liquid fuels employed in the openhearth.

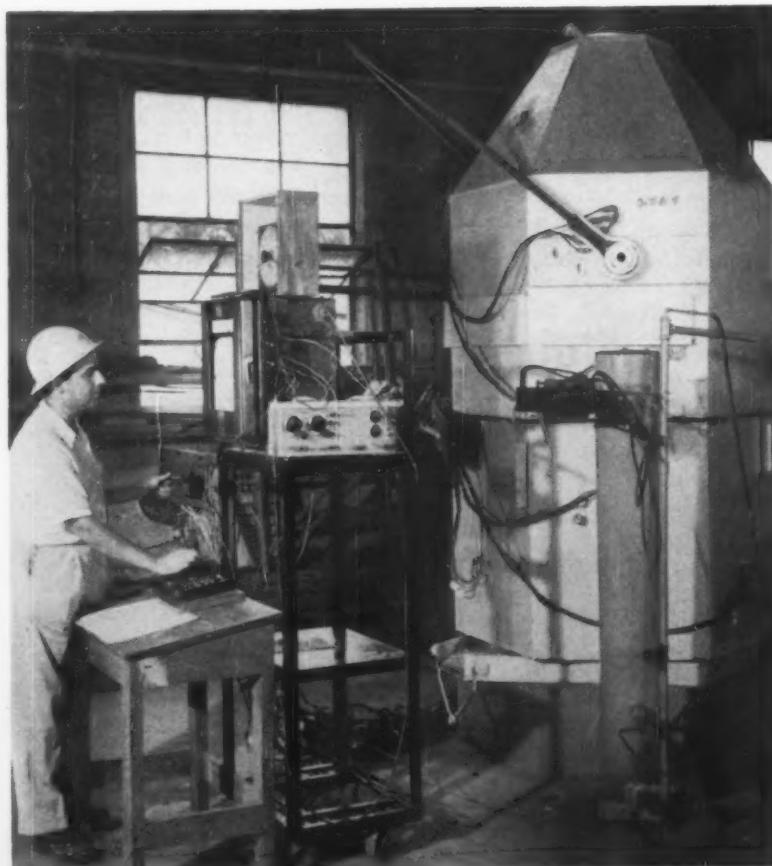
Use Cheap Energy—Because the efficiency now achieved in large, high-powered arc furnaces is close to the maximum attainable, the gap between arc and openhearth isn't likely to be narrowed by improving electric furnace practice. But a promising answer seems to lie in substituting cheap energy from combusted fuels for part of the expensive electrical energy now used to melt and refine all-scrap charges in arc furnaces.

That's where a scrap preheater comes into the picture. Using it in the refining stage wouldn't pay. Fuel efficiency would be at its worst during this high-temperature phase of the process.

But using a preheater in the melt-down stage can lead to substantial savings. It is at this stage that the bulk of electrical energy (about 70-80 pct) is normally consumed.

New Approach—Starting with the knowledge that relatively high efficiency from fuel combustion can be secured in a properly designed furnace during the initial portion of the meltdown period, the Pyrometallurgical Laboratory of the Bureau of Mines, Pittsburgh, began to explore the preheater approach.

It seemed essential that an auxiliary furnace be used for the preheating operation. Operating a fuel-fired preheater in conjunction with an arc furnace would permit both heating systems to perform in temperature ranges where each was most advantageous. Such a combination might combine maximum



TEST UNIT: Bureau of Mines obtained enough data with laboratory preheater to prove its feasibility and economy in industrial applications.

TABLE 1: Conditions for Runs*

Scrap Bed				Heating					
Run No.	Depth, ft	Volume, cu ft	Bulk density, lb/cu ft	Combined air and fuel flow, ft./minute	Air-fuel ratio	Heat from combustion, Btu/hr/sq ft	Flame temp., °F.	Max. bed temp., °F.	Temperature difference (bed-flame), °F.
11	6	42.4	56.9	37.3	23.0	81,300	1,940	1,530	-410
12	6	42.4	56.9	38.8	25.5	82,500	1,790	2,340	-450
14	6	42.4	56.9	(a) 40.0	20.9	97,200	2,080	1,570	-520
				(b) 24.6	30.8	43,800	1,540	1,440	-100
15	3	21.2	95.5	12.5	24.9	27,400	1,830	1,500	-330
16	3	21.2	95.5	18.7	23.1	49,200	1,930	1,540	-390
17	3	21.2	95.5	31.1	23.4	78,300	1,910	1,440	-470
18	3	21.2	95.5	31.1	23.4	78,400	1,910	1,440	-510
19	3	21.2	95.5	43.2	21.0	112,000	2,080	1,520	-560

Note: (a) For first 80 minutes. (b) For remainder of run. * 3-ft diam beds.

productive capacity with lowest overall energy cost.

Another factor would involve adapting a suitable preheater to existing arc-furnace shop conditions. Keeping all of these requirements in mind, the Bureau of Mines designed and built a top-fired preheater.

Highly Adaptable—There were two main reasons for choosing a top-fired, downdraft, vertical furnace. Previous experience with this type of furnace had been favorable, and it seemed highly adaptable to top-charge arc-furnace practice. It was a design known to be thermally efficient, easily controllable, simple to operate, and inexpensive to build.

The actual test furnace is shown on the opposite page. It holds a bed of scrap 6 ft deep by 3 ft in diameter. A mixture of air and natural gas is fired into the top. The hot combustion products flow downward. Heat is transferred to the bed from the gases. These pass through the supporting grate and are exhausted through the flue.

Good Control—Excluding heat

losses to the walls, the thermal efficiency of this furnace is related directly to the temperature of the scrap at the bottom of the bed. For a cold charge, it is nearly perfect at the start and decreases as the bed becomes warm. Exit gases carry off sensible heat.

The maximum temperature is developed at the top of the bed. This temperature can be controlled precisely and easily by adjusting the air-gas ratio at the burner. In an industrial application, a radiation pyrometer sighted on the top of the bed will provide the sensing element for controlling the air-gas ratio.

Shop Alternatives—How could a similar preheater be arranged for use in a top-charge electric furnace plant? The furnace base could be floor mounted. Or it could be incorporated into a transfer car in shops where charging buckets are moved by car to the charging floor. At the top, the pyramidal combustion chamber and the burner would constitute a removable heating unit. The grate and furnace body would constitute a portable unit

that would serve as a charging bucket.

For test purposes, the furnace was charged with structural steel angles—each 3 x 3 x 1/4 x 9 in. These were randomly arranged to form a bed of desired depth, either 3 ft or 6 ft. Both depths were packed to a bulk density corresponding to common scrap densities.

Check Burner—More than 30 test runs were made. Many were intended to check specific points concerning heat-transfer relationships. Previous work on heat transfer from a stream of gas to a bed of solids was too limited to form a valid basis for the design and operation of an industrial top-fired preheater. Other runs helped to evaluate burner performance.

Tests on 6-ft beds of scrap contained 2,411 lb at a bulk density of 56.9 lb/cu ft. The 3-ft bed weighed 2,050 lb and had a bulk density of 95.5 lb/cu ft.

In Table 1 are shown heat-input and gas-flow data for each run, along with calculated adiabatic flame temperatures and maximum

TABLE 2: Heating Times and Efficiencies (Using Run No. 11 as typical)

Attained fraction of heat to melt, pct	Period to heat bed, minutes		Heat-transfer efficiency, pct		Fraction of attainable heat, pct
	Upper 3 ft	Full 6 ft	Upper 3 ft	Full 6 ft	
20	35	58	60	64	49
30	60	98	46	51	74
40	134	—	23	—	98

TABLE 3: Summary of Heating Times and Efficiencies

Run No.	Depth of bed, ft	10 pct		Attained fraction of heat to melt		40 pct	
		20 pct		30 pct		Time, minutes	
		Time, minutes	Efficiency, pct	Time, minutes	Efficiency, pct	Time, minutes	Efficiency, pct
11	6	30	77.0	58	64.0	88	51.0
	3	17	79.0	35	60.0	60	46.0
12	6	23	66.5	60	47.0	150	27.5
	3	10	75.0	36	42.5	112	19.0
14	6	18	67.0	40	53.0	79	45.0
	3	6	78.0	18	60.0	39	43.0
15	3	68	52.5	138	52.0	—	—
16	3	33	53.5	69	52.0	122	46.5
17	3	22	49.5	53	43.5	144	25.5
18	3	26	48.5	—	—	—	—
19	3	17	47.0	39	42.5	81	31.5

temperatures attained in the beds during respective runs. The total volume of natural gas-plus-air input listed is also a close approximation of the flow rate of combustion products. Complete combustion yields 99 volumes of product for every 100 volumes of reactants.

Make Settings — The adiabatic flame temperatures shown were calculated for the fuel-gas composition and the particular air-gas ratios used. From the data, the difference between the calculated adiabatic flame temperature and the observed maximum scrap temperature was directly related to the flow rate of the combustion products.

Once the relation between the flow rate of combustion products and the temperature difference for a particular furnace has been learned by experience, the burner setting for a desired maximum temperature can be estimated by calculation. In all, these results emphasize the controllability of the process.

The results of run No. 11 are typical of those for the other runs. Fig. 1 shows how the temperature at 1-ft intervals within the bed changed with time during the run. Both furnace and charge were initially at room temperature for all of the runs. The top of the bed heated quickly to approach the maximum attainable temperature. Rate of temperature rise was progressively slower at greater depths

in the bed as the curves show.

Varied Conditions — The time-temperature relation 3 ft down is accented. This curve was considered as approximately the bottom of a bed 3 ft deep for comparison with like bed depths of greater bulk density in runs Nos. 15-19. The time-temperature relation at the bottom of the bed (6-ft depth) approximated the temperature of the outgoing gases.

An analysis of heating rates and thermal efficiencies in run No. 11 is shown in Fig. 2. Two sets of curves are included: one set is for the full bed 6 ft deep, the other set the upper 3-ft portion of this bed.

The data are cumulative from the start of the run to the elapsed time shown. They were obtained from heat balances calculated for successive 20-minute intervals. Similar heat balances were constructed for all runs (74 heat balances in all).

Relative Factors — The heat that had been cumulatively transferred to the bed of scrap up to any heating time is plotted in Fig. 2 in terms of two relative quantities. These compare actual accomplishment with the limit attainable.

Percentage of attainable heat refers to the actual heat contained by the scrap at a given time as a percentage of the maximum heat the scrap could have absorbed if all of it were heated uniformly to the highest temperature attained at the top of the bed during the run. Heat-

transfer efficiency is the percentage of the heat supplied by fuel combustion (during a given time) that was actually absorbed by the scrap bed.

Avoid Heat Loss — At any time during the run, the 3-ft bed had reached a higher percentage of attainable heat than the full 6-ft depth. But the heat-transfer efficiency was less for the upper half than for the full bed. Evidently, the lower layer acted as a scavenger to recover heat from the gases, leaving the already heated scrap above. There must be a layer of relatively cool scrap on the bottom if high sensible heat loss in the exit gas is to be avoided.

A measure of heat absorption of even greater interest to steelmakers is its relation to the heat required to melt the charge. For this purpose, the attained fraction of heat to melt refers to heat actually contained by a charge at a given moment. It is expressed as a percentage of the heat that would be needed to melt an equal weight of 0.2 pct carbon steel and superheat the liquid to 2800°F. This thermal requirement was calculated to be 573 Btu/lb of steel initially at 77°F.

Quick and Efficient — In Table 2, data from run No. 11 show the time required and the efficiencies attained in heating up to 20, 30, and 40 pct of the heat required to melt. Thermal efficiency drops as the attained fraction of heat to melt is

increased. The first 30 pct of the heat needed for melting can be imparted to the scrap in reasonable time with acceptable thermal efficiency.

The actual heating times required to attain a particular fraction of the heat to melt during a number of runs is shown in Table 3. Heating periods and resulting thermal efficiencies are listed for each run with respect to attained fractions of the heat to melt for 10, 20, 30, and 40 pct, respectively.

What to Expect—Data are shown for the upper 3 ft of the beds used in runs Nos. 11, 12, and 14. This facilitates comparison with runs Nos. 15-19 where beds of similar depth but greater bulk density were heated. From the results, it can be expected that at least 30 pct of the heat required to melt scrap could be imparted in a practical length of time. Also, a thermal efficiency approaching 50 pct may be expected in a commercial scrap heater of simple design.

List Savings—What savings can be realized when 30 pct of the heat required to melt scrap is applied by gas in a scrap preheater on a practical basis? Based on a comparison of electrical power costs and electrodes consumed vs natural gas costs in the Pittsburgh area, savings will probably vary between \$1.08 and \$1.33 per ton for energy costs alone. Melting costs could be lowered by 18 to 22 pct for beds 6 ft deep. Deeper beds would be even more efficient.

Other advantages that can be expected from the use of a scrap preheater include:

- 1) Reduction of electric furnace time needed to complete the melting of a preheated charge.
- 2) Better carbon control. Excess air in the combustion products will burn oil and grease from scrap at higher temperatures. At lower temperatures, these contaminants will melt and trickle through the grate.

- 3) Avoiding possible explosions by drying wet scrap before feeding to electric furnace.

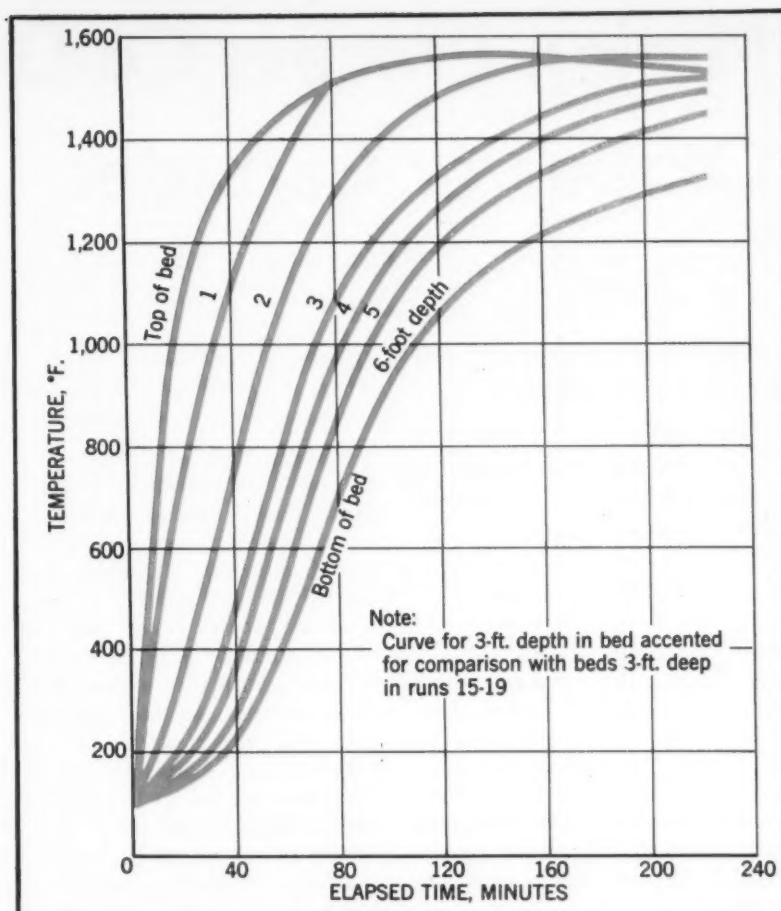


FIG. 1: Data relates scrap temperature to heating time for run No. 11.

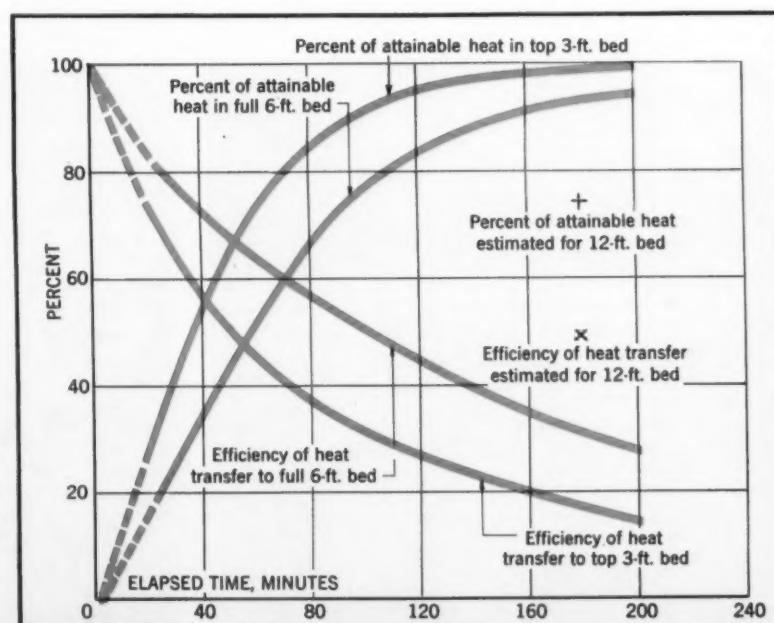


FIG. 2: Relations between heating period duration, percentage of attainable heat, and heat transfer efficiency for two depths of beds.

Plating Process Co-Deposits Oxides or Carbides

By A. E. Grazen—Vice President, CEM Div., Platecraft of America, Inc., Buffalo

Very small particles are dispersed in a metal matrix.

Then, either as a plated film or electroform, the composite material forms a tough surface with high wear resistance.

■ Tough coatings made up of carbides or oxides dispersed in a metal matrix are now being applied by a new electroplating process developed at Platecraft of America, Inc. The coatings greatly improve the life of gages, cutting tools and other wear surfaces; they're being tested on a number of production parts in the automotive, aircraft and electrical fields, as well as for household items.

Known as the CEM process (Composite Electrochemical Materials), the new method produces

composite metal-oxide structures which may be used either as adherent coatings or electroforms.

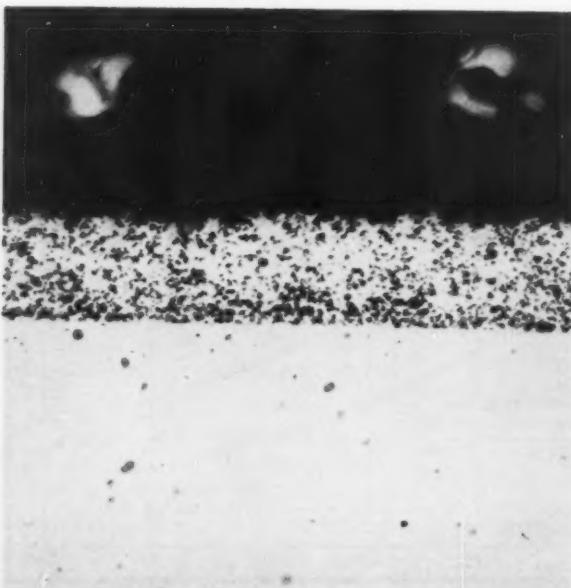
Makeup Varies — CEM coatings encompass a variety of compositions. Finely divided particles of silicon carbide, tungsten carbide, aluminum oxide, zirconium oxide and similar additives are dispersed in nickel, copper, silver, cadmium and other metals. Coatings containing up to 50 pct by volume of additive particles have been prepared. The usual concentration falls between 10 and 35 pct by volume, depending on the kind of additive and the intended end use.

Size of the carbide particles is usually less than 20 microns diam. But larger particles can be deposited. Fine particles make it practical to deposit composite coatings as thin as 0.0005 in. In certain ap-

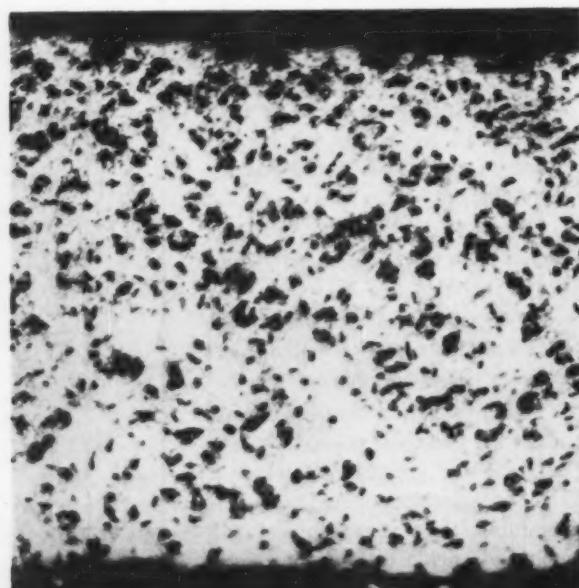
plications involving severe abrasive wear, particles up to 150 mesh have been employed.

Process Is Simple — The CEM method uses the principles of electrochemistry together with special processing equipment. Simple controls effect consistent reproducibility, and automation allows high production rates. The cost of application in many cases compares favorably with chromium plating, while wear life may be extended several times.

The as-plated surface has a velvety texture similar to that produced by vapor-blasting. Finish ranges between 20 and 60 microinches, depending on thickness and composition of the deposit. Coating thickness tolerances are similar to those obtained with conventional plating. The as-plated surface has



TOUGHER TUBE: Tungsten carbide dispersed in a nickel matrix is plated on steel tubing. 250x, unetched.



GOOD DISPERSION: SiC-Ag coating is one of many combinations possible with CEM. 250x, unetched.

excellent oil-retaining qualities and is ideal for many lubricated applications.

Where high finish is required, the coatings may be ground and lapped.

Builds Up Electroforms — CEM materials can be electroformed to make items such as bearings, die cavities, cylinders, female thread gages and nozzles. In this technique, the CEM material is built up on a master to the thickness required for structural integrity. The master, usually made of aluminum or plastic, is then removed.

The internal surface is as good as that of the master or slightly better. CEM material may also be deposited onto a master as a thin coating (0.005 to 0.020 in.), then backed with conventional electrodeposit or other materials.

Properties of the composite materials are a function of the kind of matrix and particulate phase present, concentration, and particle size. In addition the properties of the matrix can be changed by varying the composition and operating conditions of the plating solutions used.

Ni Type Is Tough—Considerable information has been obtained on nickel-base composite systems. Tensile properties of electrodeposited

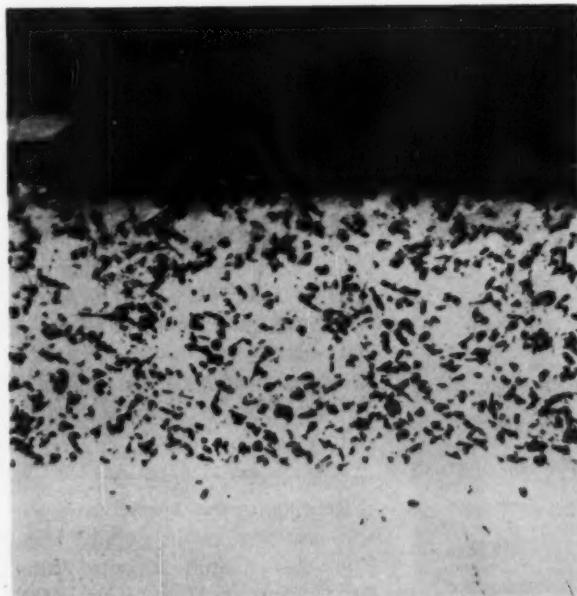
Composite Coating Cuts Wear*

Weight Loss, grams	Test Time, minutes			
	10	20	30	40
SiC-Ag Coating:				
Block	0.0039	0.0012	0.0014	0.0007
cumulative	0.0039	0.0051	0.0065	0.0072
Ring	0.0012	0.0011	0.0002	0.0001
cumulative	0.0012	0.0023	0.0025	0.0026
Plain Ag Coating:				
Block	0.0327	0.0170	0.0161	
cumulative	0.0327	0.0497	0.0658	
Ring	0.0011	0.0014	0.0011	
cumulative	0.0011	0.0025	0.0031	

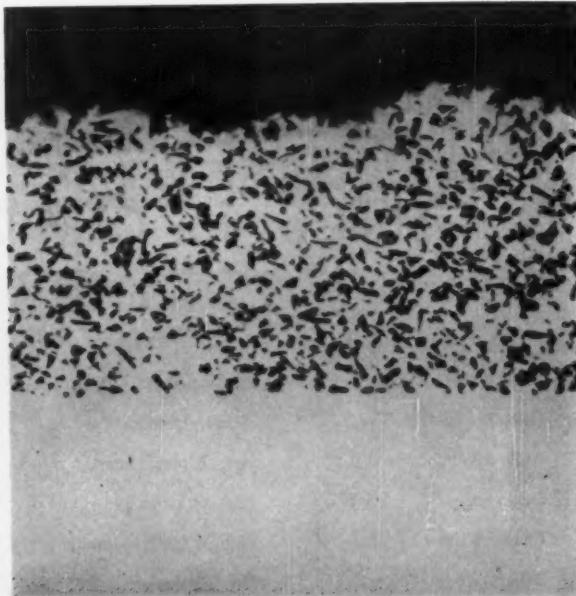
* Determined after running coated blocks and SAE 52100 rings at 12,000 psi.

nickel vary from 90,000 to 200,000 psi; preliminary data indicate that CEM coatings lie in this strength range.

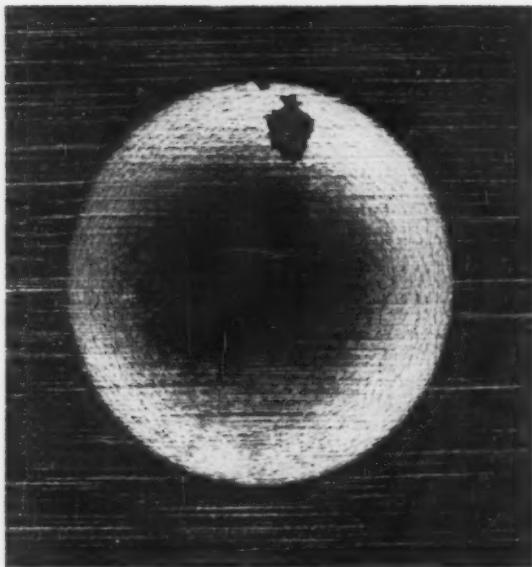
Microhardness of SiC-Ni coatings ranges up to 63 Rc. Hardness of the silicon carbide particles is 2700 Knoop—many times harder



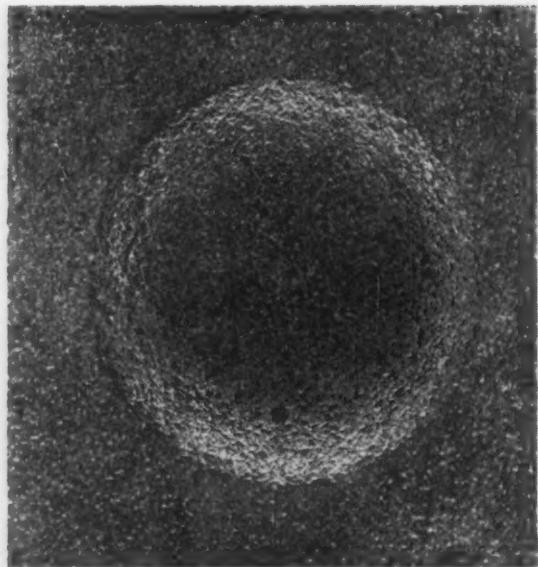
TYPICAL COATING: SiC (about 35 pct by volume) is evenly dispersed in a nickel matrix. 250x unetched.



OXIDES, TOO: Aluminum oxide and nickel composite gives wear-resistance to plug gage. 250x, unetched.



IMPACT RESISTANCE: Ballistic impact test with 5/32-in. steel ball at 30 ft-lb flakes 0.001-in. chromium



plating (left). SiC-Ni material of the same thickness (right) deformed evenly without actual failure.

than the composite hardness. Coatings retain their hardness to temperatures of 500°F. At 500°F, the coating anneals during the first few hours of operation, then recovers most of its hardness (probably by slow solution of carbide in the matrix).

Nickel-base CEM coatings have been tested for corrosion, thermal shock resistance, bend ductility, and impact. They proved superior to chrome plate in every test, and almost as good as chrome in bearing compatibility.

Trials In Service—A gage coated with SiC-Ni, lapped and ground,

lasted 35 days when used against cast iron. Chrome-plated tool steel gages last an average of 1.3 days. In gaging stainless steel, the CEM-coated gage lasted more than 10 times as long as chrome-plated types.

Dowel pins used to locate rough castings of cylinder heads formerly lasted 10 to 14 days when made of tool steel or chrome-plated tool steel. SiC-Ni coated pins last six weeks or more. In addition, it's reported that quality of the product is much improved because of more accurate locating for longer periods of time.

Coining punch and extruding ring life are increased 40 to 300 pct by application of CEM coatings. Development work is continuing and even longer life is expected in the near future.

Coated dado cutters for wood outlast steel cutters by over 400 pct. Coated circular saw blades and wood chisels also perform well.

More than double the life of expensive sprayed-on carbide coatings has been reported for CEM-coated acoustical-tile drills.

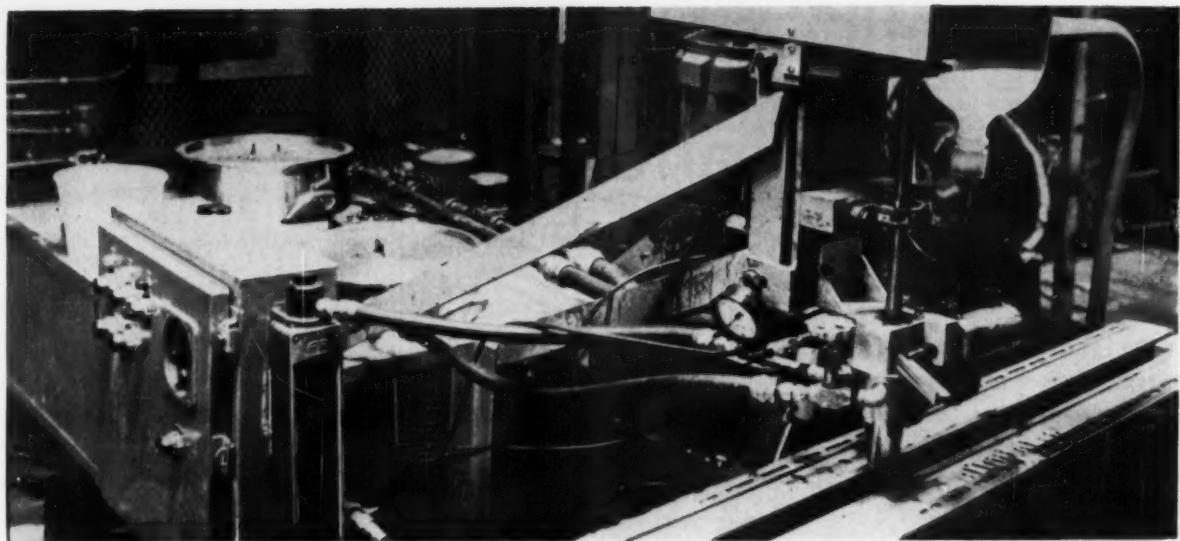
Performance of coated stamping mandrels is said to be excellent, with no measurable wear after hundreds of thousands of pieces.

Development programs with leading manufacturers are being started on piston rings, valves, electrical contacts, continuous coating of wire and sheet, high temperature seals and bearings, nuclear hardware, electric shaver heads, electroformed dies and gages, friction materials, and many other uses.

Typical Uses for CEM Coatings

Woodworking tools	Electroformed bearings	Conveyor parts
Stamping jigs and tooling	Rocket nozzles	Air probes
Armature-winding mandrels	Printing plates	Flutter dampers
Electrical contacts	Friction materials	Retaining rings
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Drill bushings	Mechanical seals	Plastic-stamping dies
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Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.



CONTROLS CHARGE: Nozzle of metering device extends into hole of panel to charge precise amount of plastic.

Fill Steel Panels the Easy Way

Pour Liquid Plastic Foam With Automatic Dispenser

Steel panels filled with plastic foam form a good, tight, and moisture-proof insulating and building material.

■ The mating of steel and foam has produced a building panel that is light and strong with excellent insulating qualities. The foam, poured into the panel as a liquid, expands through chemical action against all sides of the panel cavity.

Extensive testing has proven the panel's resistance to impact, puncture and corrosion. Now the manufacturer, U. S. Steel Homes Div., U. S. Steel Corp., Harrisburg, can confirm in actual use what had been demonstrated in the laboratory.

Architect's Choice—The panels form part of the outside wall of the new Hempt Office Building, Camp Hill, Pa. Produced in three sizes, they measure 3 x 3 ft and 3 x 5 ft, the principal panels, and 5½ x ½ ft, a filler panel.

All of the panels are 1½ in. thick, the hollow area between the

shells being filled with foam. The foam is a polyurethane plastic, called Nopcofoam, made by Plastics Div., Nopco Chemical Co., North Arlington, N. J.

Under the present production setup, the steel skins, or shells, are stamped to size and shape. Riveted fasteners complete the assembly.

Separated by cross pieces, three assembled panels are placed side by side on one half of a wooden mold. The other half fits over the panels with clamps to keep mold tight.

Unit Meters Foam—Placed on edge, the mold is conveyed to an automatic mixing and dispensing machine. Called the Nopcometer, it charges each panel with the liquid.

The operator directs the nozzle of the dispenser into a small hole cut in the top of the first panel. The unit feeds the correct amount of foam. Succeeding panels are filled as the mold is moved along.

As the plastic is fed into the

panel, the pressure of the foam pushes the steel skins against the mold with equal pressure over the whole area. After the foam hardens, the panel holds its flat shape and the foam bonds to the metal, holding the skins firmly in place.

Stress Light Weight—The foam density of 2 lb per cu ft is adequate for non-load bearing since the material is not used for structural strength. The panel itself averages about 4½ lb per sq ft.

This light weight reduces labor costs both at the plant and during installation. In weighing less than standard steel construction, the foamed panels have reduced shipping charges.

Testing engineers find that moisture has no effect on performance of the foam-filled panels, but does have a direct bearing on the effectiveness of other panels. After being exposed to the elements for four years, one foamed panel exhibited no corrosion under the foam.

Stub Drilling Without Bushings Saves Tools and Time

By Harry Conn—Chief Engineer, Scully-Jones & Co., Chicago

The stub-drilling concept is a tool, time, and money saver. Short, rigid drills last longer, can be changed quickly, and are often used without bushings.

■ The most important problems in production drilling concern short tool life per grind, excessive time for changing tools, accuracy in hole location, drill breakage, and accuracy of hole size.

Some of the conditions that cause

these problems are: (1) low torsional strength of long twist drills, (2) chatter, (3) excessive bending due to too much feed, (4) lack of rigidity at the chisel point when the drill starts to cut, (5) bushings that hinder removal when the bushing plate is carried by guide rods in the head of the machine, (6) undersize drill margins caused by rubbing against bushing walls.

Propose Shorter Drills—As an approach to solving these problems,

the concept of stub drilling is attracting much interest. It involves the use of shorter drills—in many cases without bushings or bushing plates.

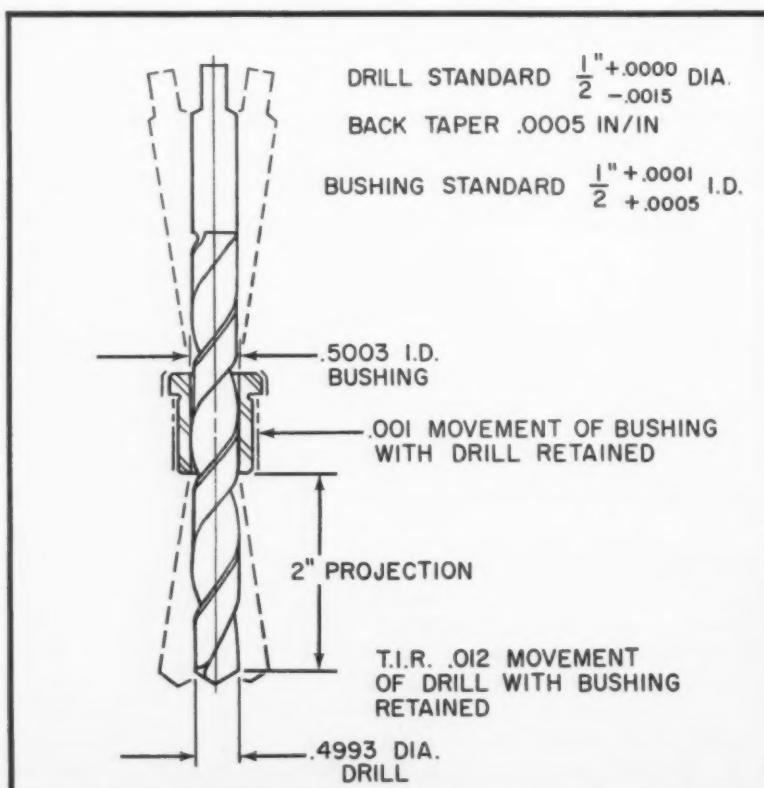
Consider a two-flute twist drill at its best operating condition. It has the design characteristics of a torsion spring—with cutting edges added, of course.

It follows that the shorter the drill is from its driving position to its cutting edge the stiffer it will be. Thus a shorter, more rigid drill should resist chattering, which is the greatest hindrance to long tool life.

Tests Prove Theory—Fig. 1 shows what happens in drilling S-816 high temperature alloy with drills of progressively shorter flute length projection. The test was one of a series conducted by National Twist Drill & Tool Co. Shortening the drill projection from $2\frac{1}{8}$ in. to $1\frac{11}{16}$ in. reduced the torsional windup and increased relative drill life per sharpening by 80 times (8000 pct).

This is neither an isolated case nor the most unusual example of what can happen when drill projections are shortened. Using the same principle under different circumstances actually increased the number of holes drilled per sharpening by 300 times. These jobs were done with no bushings to guide the drill.

The foregoing examples are not intended to show that drilling without bushings can be done in all materials to yield tremendous increases in drill life. The point is that shorter drill lengths projecting from holders will be more rigid and should thus have longer lives; also



WHAT CAN HAPPEN: Several factors can limit the ability of a standard bushing to guide and support a standard drill. The list includes: back taper on the drill, spindle runout, drill tolerance, and the short wraparound bearing area the bushing provides for drill margins.

that it pays to eliminate drill bushings on single purpose machines wherever possible.

Forces that Apply—A twist drill is subject to three main forces: (1) an axial thrust force as the drill feeds into the work, (2) a radial force (torque) that turns the tool, and (3) side thrust.

Drill bushings are used in production machines to overcome side thrust caused by drill-grinding irregularities, rough surfaces, and excessive spindle runout. There is little, if any, side thrust with drills 5/16 in. and smaller.

Invariably, there is some misalignment between the drill and the drill bushing. It may be due to some eccentricity—in the drill itself, in the tool holder, or between the spindle hole and spindle bearings.

Misalignment may also result from expansion in the drill head due to a temperature rise above that at which the head was bored. Banging and beating spindles to remove drills can result in spindle runout which, in turn, can cause drills to be out of line with their bushings.

Tooling Methods Compared—Fig. 2 shows both the old and the new way to tool a high production machine. The "new" drawing shows the use of a quick-change, preset tool, whereby the drill is gripped on the margins for locating and driving. A back-up depth adjustment screw also serves as a positive drive.

Eliminating bushings and bushing plates does not mean that much larger spindle bearings are needed. The main wear on such bearings is caused by misalignment between spindle and bushing. Misalignment of more than 0.002 in. will cause spindle deflection and bearing wear.

Axial thrust is the main design consideration in spindle bearings for drilling machines. Stub drilling doesn't alter this fact. Side thrust is important only while the drill point is entering the workpiece. When the margin of the drill enters the hole, the hole itself serves as an outboard bearing support.

Key Ratio—A bushing is helpful

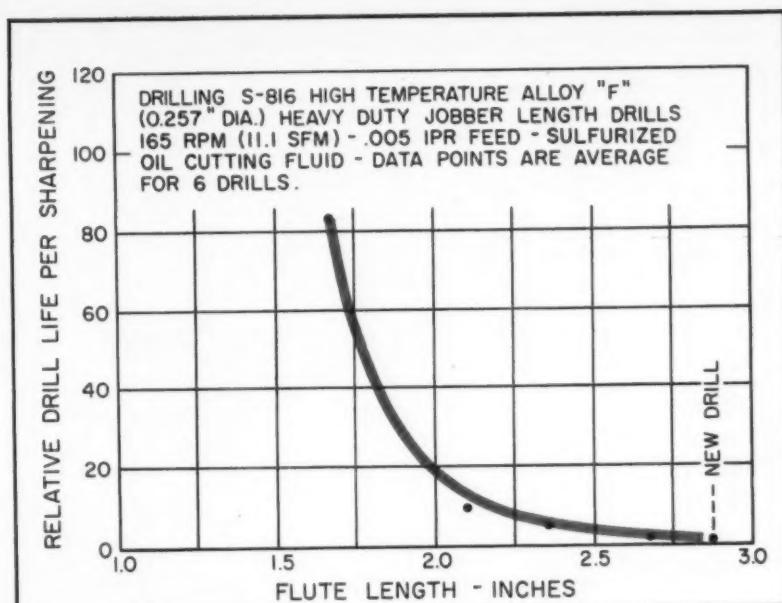
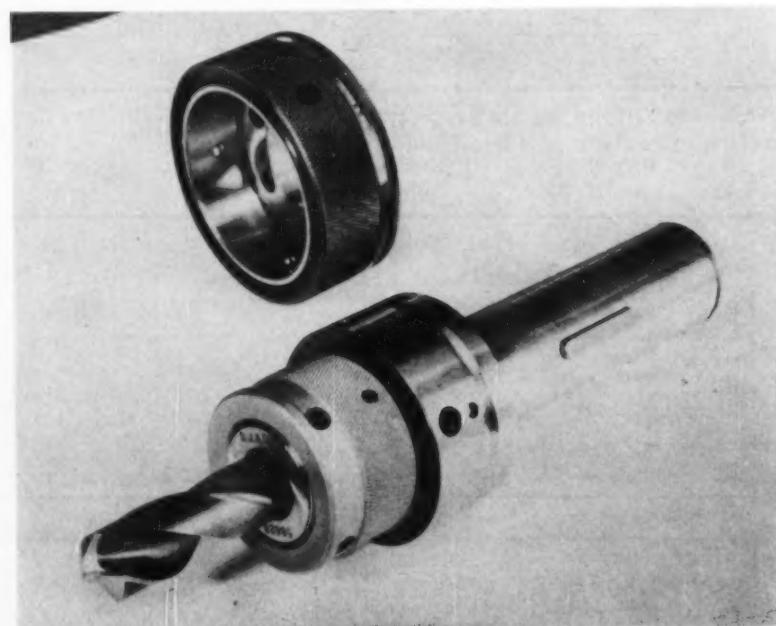


FIG. 1: Shortest flute length in this test series boosted drill life 8000 pct over that obtained with a new drill projecting 2 1/8 in.



APPLY NEW CONCEPT: Components of the quick-change Stub-A-Long holder made by Scully-Jones for use with multiple spindle drilling heads.

in reducing side thrust and increasing rigidity when the drill starts to cut. But if the ratio of drill projection to diameter is low enough, bushings are not needed in many cases. A 1/2-in. diam drill projecting 2 in. is a very rigid ratio.

Fig. 3 shows the results of drilling tests made without the use of

bushings. No effort was made to make the drills run true; unground collets were used to hold the drills in an attempt to simulate actual production conditions.

The figures under each hole show how much the hole moved in thousandths of an inch in relation to the true axis of the spindle. Arrows in

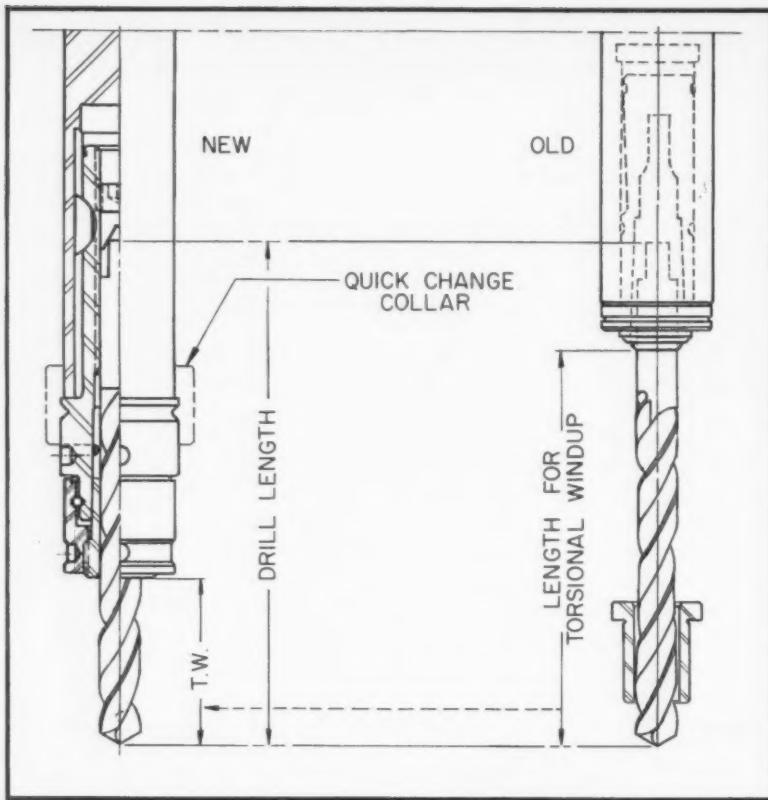


FIG. 2: Drill lengths are the same, but the "new" method (left) uses the quick-change collar so that less length is subject to windup.

dicate which way the holes moved.

Cuts Changing Time—Stub drilling without a bushing plate also speeds tool changing. The cost of changing a drill in high production transfer machines ranges from 6 to 1000 times the perishable or tool depreciation cost per insertion. Use of a quick-change collar and a preset tool reduces the tool changing time or cost at least 80 pct.

In line with these principles, drilling spindles should eventually be designed for shorter projection. Drill heads, also, should approach workpieces more closely. The return stroke should allow ample clearance for removal of tools and holders without banging and beating the spindles.

Moreover, more accurate drill head spindle locations should permit tighter hole-to-hole dimensioning instead of leaving the precision to be built into bushing plates. If the drillhead temperature rise is known, heads may be bored short to allow for expansion.

In some instances, stub drilling may require double margin drills.

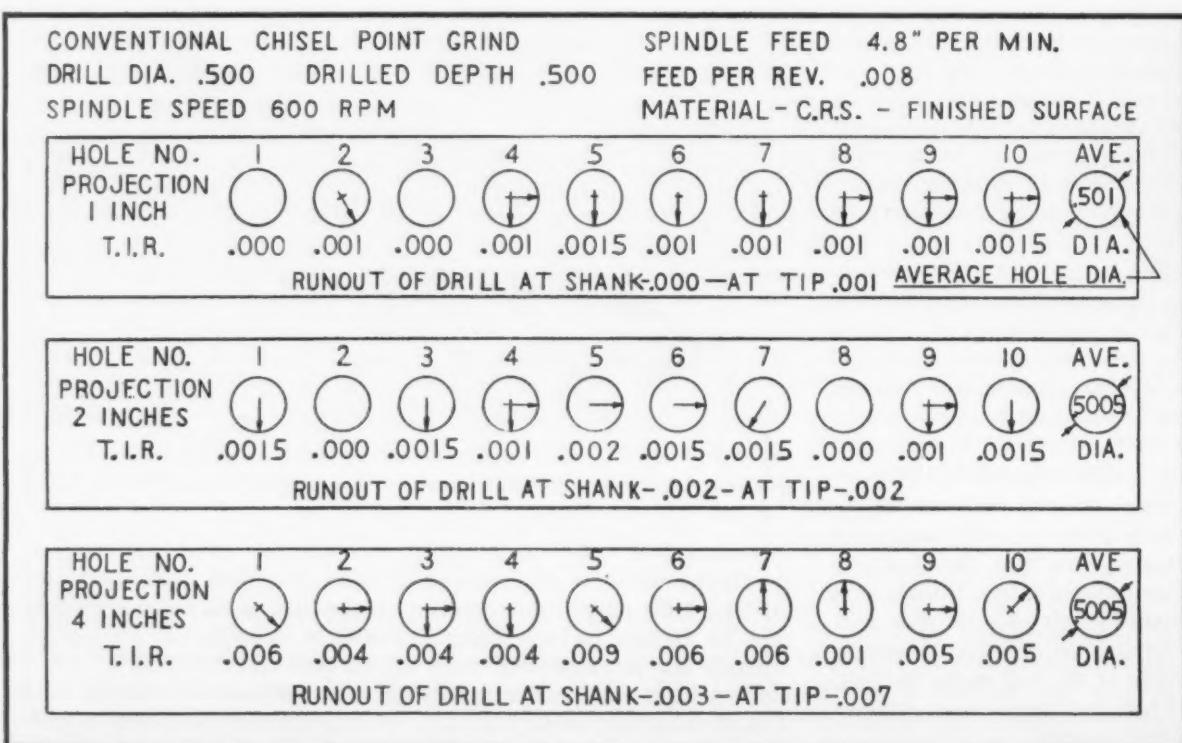
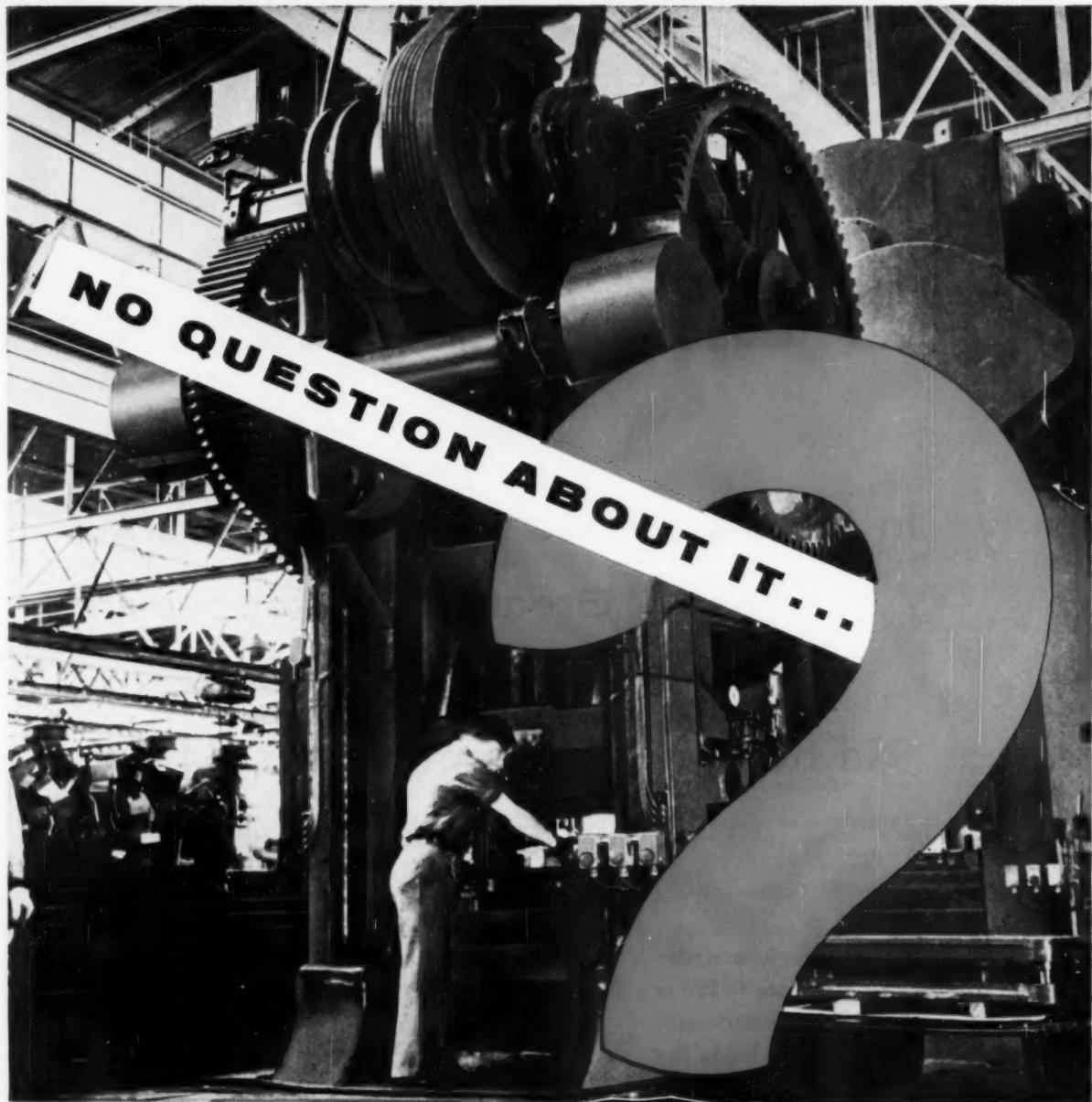


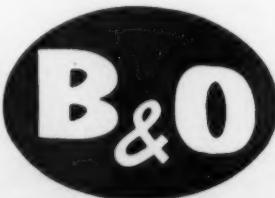
FIG. 3: No bushings were used in these tests, which show that shorter drill projections are more accurate.



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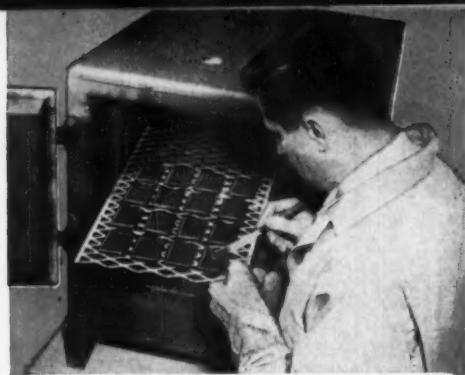
RYKON Grease's unique properties make it truly multi-purpose. This leads to many

worthwhile economies. With one grease to do possibly every grease lubrication job in a plant, there's no chance for application mistakes. Inventory and handling of many single-purpose greases is reduced or eliminated. Maintenance training and supervisory follow-up is greatly reduced.

More facts about **RYKON** Grease are yours for the asking. Call the lubrication specialist in your nearby Standard Oil office in any of the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana)**, **910 S. Michigan Ave., Chicago 80, Illinois**.

RYKON

GREASE



High temperature test for grease. Grease samples are spread on metal strips and placed in 350° F. oven for five days. Only RYKON Grease remained workable at end of test.

has performed in ten tough applications



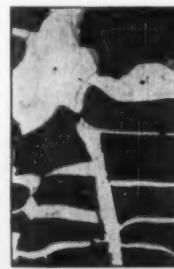
1



2



3



4

In the metalworking industry, where higher speeds, loads, temperatures and pressures are being put on bearings as a means of increasing productivity of equipment, a new type of grease has been needed. RYKON is that grease. Here are just 10 examples of how RYKON Grease has performed in tough spots:

Industry	Equipment	Type of Bearings	Conditions	Remarks
Steel Mill	various	plain and anti-friction	high temperature, heavy load, water, dirt	Outperforms all previously used greases. Less consumption, fewer bearing failures.
Steel Mill	tin line	plain and roller	high temperature, water	Hot caustic water caused other greases to run out and form deposits. RYKON lasts twice as long.
Metalworking	bearings over molten pot	—	high temperature	Temperature reaches 500° F. at times. RYKON stays in longer.
Steel Mill	pit crane, floor crane, charging car	plain and anti-friction	high temperature	Lasts twice as long as some other greases used.
Metalworking	drill head multi-spindle	anti-friction	heavy load	Other greases failed. Running cool on RYKON. No leakage.
Auto Manufacturer	switches on machine tools	—	wet	Good water protection and dielectric strength at a lower cost than previously
Die Caster	die cast machines	various	high temperature	Cut down wear considerably.
Bearing Manufacturer	high speed spindle bearings	anti-friction	high temperature, heavy load	Lasts twice as long as a high priced bearing grease. Does not darken or form varnish.
Steel Fabricator	core oven conveyor	pulley bearings	high temperature and dirt	Works where other greases ran out RYKON best ever used.
Steel Fabricator	oven conveyor	ball	high temperature	All previous greases caused trolley bearings to stick. RYKON solved problem.

Oven test shows high temperature performance of RYKON Grease. 1. Metal panel coated with RYKON and placed in oven at 350° F. 2. Same panel after five days. RYKON is still soft and ready to lubricate. 3. Another high-melt grease ready for same test. 4. Same panel after oven test Grease has failed completely.

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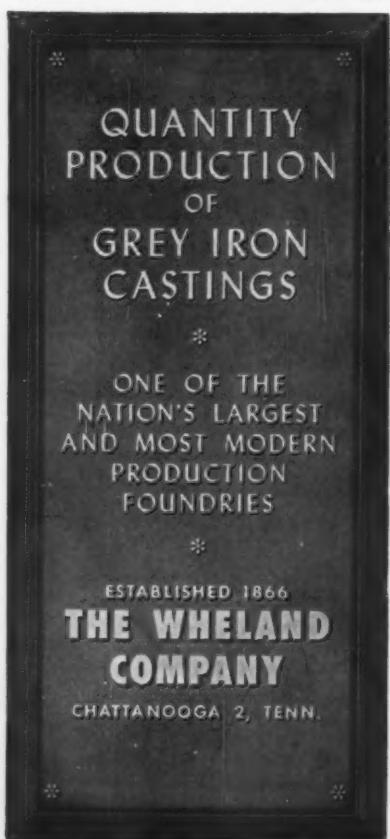
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Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 109.

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Five revised bulletins each describe one of a company's line of six-cylinder L-head gasoline engines. Included are installation diagrams, power charts and detailed specifications. (Hercules Motors Corp.)

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Temperature Monitor

Continuously scanning five thermocouple inputs per second, a new electronic temperature monitor is detailed in a bulletin. (Hagan Chemicals & Controls, Inc.)

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Computer Systems

How electronic computers can be programmed automatically is detailed in a folder. Instead of complicated machine code, regular English-language verbal commands are used. (Remington Rand Div., Sperry Rand Corp.)

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Shock Testers

Precision instruments for controlled shock simulation are featured in a 16-page booklet. It describes a shock tester which develops to 40,000-lb thrust loads. This establishes acceleration values to several hundred times gravity for

milliseconds duration of time. (Rochester Div., Consolidated Electrodynamics Corp.)

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Grate Cooler

A new horizontal-grate cooler cools materials from sintering machines, rotary kilns, roasters and some furnaces. A 4-page bulletin introduces it. (Fuller Co.)

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The complete line of one firm's industrial enclosed and heavy-duty limit switches is covered in a 20-page catalog. (Micro Switch Div., Minneapolis - Honeywell Regulator Co.)

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Germanium

Germanium and germanium dioxide are subjects of a bulletin for semiconductor makers. (Sylvania Electric Products, Inc.)

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Strain Gage

Two systems for recording and processing the multitudes of strains required to evaluate complex structural systems are detailed in a 4-page folder. Systems tabulate strains on a typewriter, IBM cards or punched tape. (B & F Instruments, Inc.)

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Alloys, Fluxes

A welding wall chart lists 89 specialty alloys and fluxes. It helps welders pick the right material for: maintenance, production and in-

stallation welding; cold repairs; overlays; cutting, gouging and chamfering without oxygen; high-strength soldering, etc. (All-State Welding Alloys Co.)

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Aluminum Grating

Aluminum grating shown in a 4-page folder serves functional or decorative uses. Though attractive in appearance, the grating is strong and rugged. (Kerrigan Iron Works, Inc.)

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Electrical Aluminum

Installed cost economy creates major new markets for electrical aluminum uses in the building industry. Such is the theme of a 32-page brochure containing a study of 400 electrical contractors. (Aluminum Co. of America).

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Testing Machines

High-capacity (1-million-lb and up) universal testing machines are presented in a 12-page brochure. (Tinius Olsen Testing Machine Co.)

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Storage Racks

Prefabricated, flexible stock storage racks are covered in a bulletin. (Jarko Mfg. Co.)

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No-corrode Valves

For corrosive environments, cast Monel and nickel valves appear in a bulletin. (Alloy Steel Products Co.)

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Steel, Aluminum

A new edition of a 256-page book includes data on steel and aluminum. Covered are: analyses, machining and fabricating, weights, safe loads, ASTM standards, and other facts for purchasing agents, engineers and shop men. (For free copy write to Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill.)

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Salem-Brosius recently acquired Alloy Manufacturing Corp. of Pittsburgh and now, through that subsidiary, has purchased the R. H. Freitag Manufacturing Co. of Akron, Ohio. To those who know both companies, the benefits the new team will bring to industry are self-evident.

Atomic energy is a case in point. Alloy specializes in precision fabrication and welding of parts for nuclear reactors, while Freitag machines and finishes the same equipment . . . thus making Salem-Brosius an integrated supplier to atomic prime contractors. The added service capacity of the new combined facility also will benefit all other industries that require precision finished parts and equipment.

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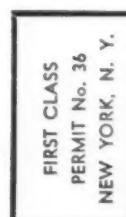
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Milling Machine

Positioning the spindles instead of the work, a milling machine offers the rigidity of a heavy-duty milling machine, the versatility of an all-angle head, and the capacity of a boring mill. A nine-page circular gives data on the two sizes manufactured. (Sundstrand Machine Tool Co.)

For free copy circle No. 34 on postcard

Grinding Control

A new brochure describes a device for regulating the feed rate to grinding mills by recording the grinding sound from the mill. The maker of the unit claims that grinding mill tonnage can be increased by 10 to 20 pct, compared to man-

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Storage Racks

A wide variety of industrial material storage racks is covered in a catalog. (Chicago Tramrail Corp.)

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The Mellowes Co. puts KEYSTONE quality in a package

Unique lock washer merchandising wins customers . . . Keystone uniformity keeps them!

To sell lock washers, The Mellowes Co., Milwaukee, Wisconsin, puts them into new, functional "Job-Pak" packages and "Coin-Pak" rolls that reduce handling expenses, simplify counting and weighing, eliminate spilling and the mixing of sizes and permit speedier inventories.

To keep their customers "sold," The Mellowes Co. specifies Keystone Lock Washer Wire. This forward-looking firm makes 250 sizes of helical spring lock washers out of Keystone Wire. Here are some of the reasons why The Mellowes Co. prefers Keystone Wire:

- Uniform diameter assures accurate dimensions when cold rolled into lock washer wire.
- Uniform structure completely spheroidized for easy coiling and close control of inside and outside diameters.
- Uniform chemical analysis and grain size provides consistent hardness in heat treating.

The Keystone research metallurgists worked hand-in-hand with The Mellowes Co. to develop a special quality of wire for the manufacture of lock washers. The result has been a quality product manufactured at the lowest possible cost.

Your Keystone Wire Specialist and the facilities of our metallurgical department are at your service. Call us today to help solve your wire problems.

Keystone Steel & Wire Company, Peoria 7, Illinois



KEYSTONE WIRE FOR INDUSTRY



HIGH FREQUENCY INDUCTION HEAT IN THE LABORATORY

For the laboratory metallurgist, the moment of truth is in the melting furnace. More likely than not, the crucible he turns to is set in the helix of an Ajax-Northrup induction coil. For ever since its discovery, high frequency induction heat has been instrumental in the birth of new metals.

The *clean* heat of the induction furnace has ushered in alloys unmarred by impurities . . . has permitted the successful development of vacuum metallurgy. Its precise control of heat permits alloying as the metallurgist desires —no longer at the mercy of chance. And the stirring action inherent in Ajax-Northrup induction melting has actually made possible many new metals and alloys.

There you have just a few of the advantages that make Ajax-Northrup furnaces a laboratory standby. Even in this day of computers, spectrographs, and electron microscopes, they are assured an important place in the search for the unknown . . . the study of the known.

Available in capacities from a few pounds to several thousand pounds, Ajax-Northrup furnaces may be powered by economical converters or heavy duty motor generator sets. Write for Catalog.

Ajax Electrothermic Corp., Ajax Park, Trenton 5, New Jersey.

Induction heating & melting
Ajax
NORTH RUP

ASSOCIATED COMPANIES: **AJAX ELECTRIC COMPANY-AJAX ENGINEERING CORPORATION**

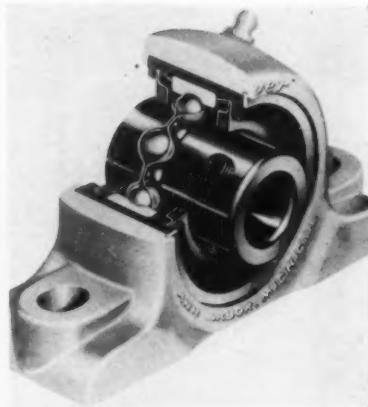
New Materials and Components

Pillow Block Bearings Give Silent Service

Where extremely quiet operation is essential, new pillow block ball bearings do the job. The sound-conditioned bearings have a synthetic-rubber cushion between the outer ring and the pillow block housing. Not only does this suppress noise, it cuts vibration. Housings are of a lightweight, ductile material that resists shock and vibration. Units come in five shaft sizes from $\frac{1}{2}$ through 1 in. Offered as a

separate unit is a component simplex machine unit bearing of these pillow blocks. It consists of a pre-lubricated, single row bearing with large balls and deep raceways. Two seals and a wire lock for use in mounting are provided. Outer diameter is inclosed in the oil-proof synthetic rubber cushion used in the sound-conditioned pillow blocks. (Hoover Ball & Bearing Co.)

For more data circle No. 42 on postcard, p. 109



Thermometers Measure From -350° to $+1000^{\circ}\text{F}$

Completely redesigned indicating dial thermometers measure temperatures in the range of -350° to $+1000^{\circ}\text{F}$. They come in a variety of: (1) remote or direct reading types; (2) methods of ambient temperature compensation; (3) filling mediums for different temperature ranges and uses; (4) case sizes, materials and styles, and (5) thermometer bulbs of different sizes, shapes and materials to suit application needs. Instruments fit many jobs

where simple yet accurate temperature indication is specified. Remote reading models employ conventional armored capillary tubing to connect the temperature sensing bulb to the dial indicator. The latter can be up to 125 ft from the bulb. Direct reading styles, where the bulb is closely coupled to the dial indicator, include a rigid stem type or a "multi-angle" type. (American Machine & Metals, Inc.)

For more data circle No. 43 on postcard, p. 109



Machine-cut Stainless Rings Offer Economies

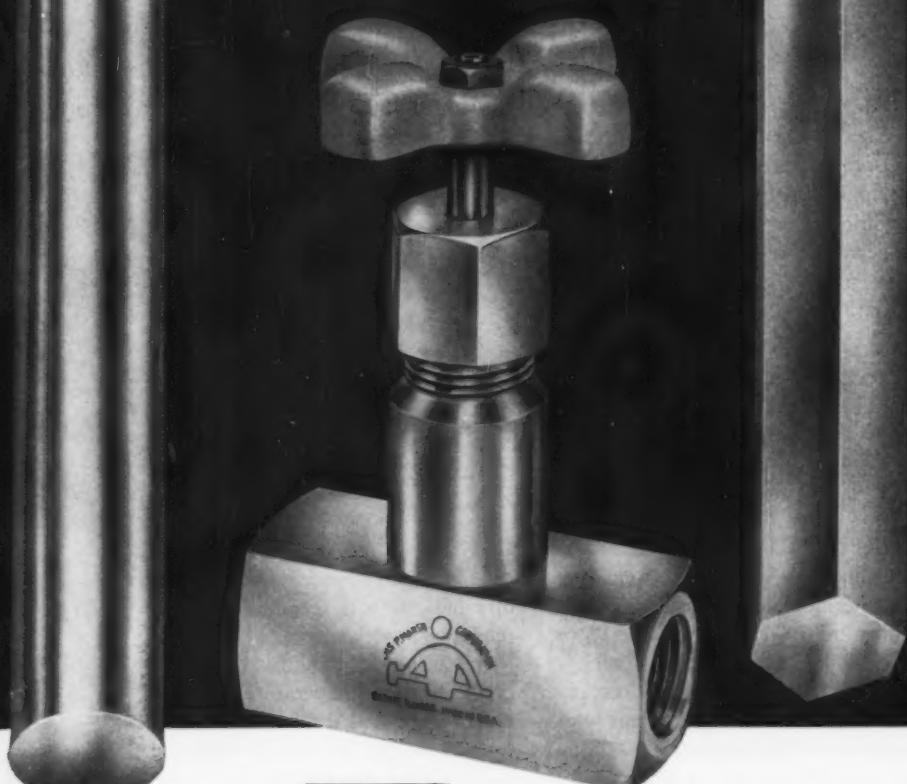
Users of stainless steel rings and disks can get them machine-cut to size with tolerances close enough and edges smooth enough for many jobs without further processing. One supplier provides normal size accuracy within ± 0.03125 . Even closer tolerance cutting is possible when required. Edges are smooth, normal plate flatness is retained, and corrosion-resistant qualities of the material are undisturbed. For

many purposes, the material is ready for use with no further machining necessary. Rings and disks generally in demand are: Types 304 and 316 stainless and extra low carbon analyses Types 304L and 316L. Of course, other analyses are available on request. If other machining is necessary, such as drilled holes or surface finishing, this can be done before shipment. (Joseph T. Ryerson & Son, Inc.)

For more data circle No. 44 on postcard, p. 109



HOW THE
BIG DIFFERENCE
IN COLD FINISHED
STEEL BARS



HELPS

MAKE POSSIBLE THE BIG DIFFERENCE
IN MARSH NEEDLE VALVES

Micrometer regulation and positive shutoff at both extremely high and low pressures were sought for a new precision valve at Marsh Instrument Co., Skokie, Ill. The result was the first throttling and shutoff needle valve that operates efficiently and safely at all pressures up to 10,000 psi.

The big difference in the Marsh valve is the unique one-piece construction from cold finished bar steel. The body and stem guide are fused into one piece by the exclusive Marsh "Conoweld" process. There is another important difference, too. The body, packing nut and packing gland are electro zinc plated, which, with the stainless steel stem, not only provides corrosion-resistance but a clean, glistening, quality appearance.

Bliss & Laughlin's Lusterized® cold drawn bar steels are used by Marsh for this unique valve. Free from drawing oils, lime and processing grit, B&L Lusterized bars contain a minimum of processing contaminants to interfere with Marsh's fusion process and precision machining. B&L Lusterized bars also readily take the zinc plating without elaborate preparation because they start out cleaner, brighter and are easier to handle.

There is a good chance the big difference in cold drawn bars—the B&L Lusterized difference—can contribute importantly in helping establish a big difference for your product, too. It's worth checking, especially since you pay no more when you specify "Bliss & Laughlin Lusterized."

Originators of LUSTERIZED® Finish—The BIG DIFFERENCE in Cold Drawn Steel Bars

BLISS & LAUGHLIN

GENERAL OFFICES: Harvey, Ill. • PLANTS: Harvey, Detroit, Buffalo, Mansfield, Mass.

Specialists in
Finish, Accuracy,
Straightness, Strength
and Machinability



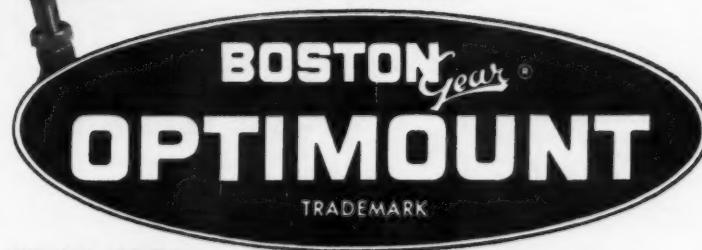
DETACHABLE MOTOR DESIGN
permits motor change in minutes
— avoids downtime for motor repairs.

IT'S THE NEW OPTIMOUNT

Ratiomotor for shaft mounting. It's the compact power package you have needed to save space without sacrifice of top transmission efficiency. Single or double reduction helical geared units deliver 87.4 to 431 output RPM. Get details—find out how OPTIMOUNT can solve your drive design problems.

Now - a
MOTORIZED
SPEED REDUCER
FOR MOUNTING
DIRECTLY ON SHAFT

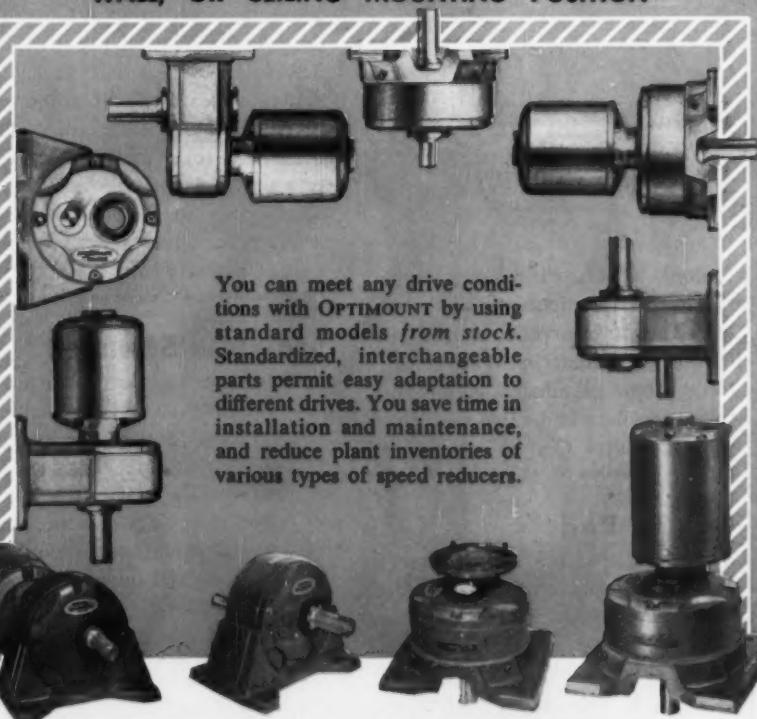
the NEW



**HELICAL GEARED
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FOR SHAFT-MOUNTING . . .

OR IN STANDARD BASES FOR ANY FLOOR,
WALL, OR CEILING MOUNTING POSITION



You can meet any drive conditions with OPTIMOUNT by using standard models *from stock*. Standardized, interchangeable parts permit easy adaptation to different drives. You save time in installation and maintenance, and reduce plant inventories of various types of speed reducers.

OPTIMOUNT delivers maximum power, with highest efficiency, through precision-finished helical gearing made to BOSTON Gear quality standards. Get details from your Distributor. He will demonstrate the many features that assure **OPTIMUM PERFORMANCE**. Boston Gear Works, 72 Hayward St., Quincy 71, Mass.

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FROM STOCK**

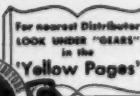
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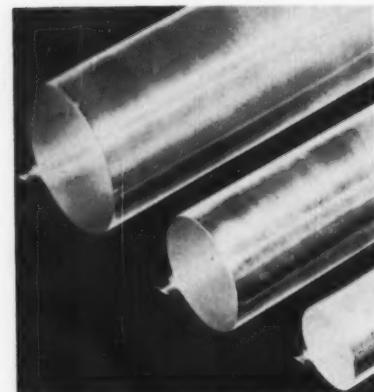
DESIGN DIGEST

Epoxy Resin

A new epoxy resin displays resistance to high temperatures and great heat stability. An epoxy novolac, it differs from conventional epoxies in that it's based on epichlorohydrin and novolac rather than epichlorohydrin and Bisphenol-A. It exhibits high chemical resistance. Typical use: high strength adhesives for metal fabricating. (Dow Chemical Co.)

For more data circle No. 45 on postcard, p. 109

resist substantially higher heat. Rods can be sawed, drilled or otherwise machined without difficulty. The plastic won't crack, craze or dis-



Plastic Vacuum Valves

Plastic high vacuum valves now available have a non-rotating stem. Though specifically for high vacuum jobs, they can serve in process control lines, instrument air lines, where corrosive conditions require plastic materials. Valves are available in polyethylene, Zytel

color on exposure to sunlight and/or weather. It has a persistent memory for its original shape, high impact strength, and isn't brittle even at low temperatures. (The Homalite Corp.)

For more data circle No. 47 on postcard, p. 109

Speed Reducer

Shaft-mounted speed reducers come in sizes up to 40 hp. They have nominal internal gear ratios of 5 to 1, 15 to 1, and 20 to 1. Completely enclosed for direct mounting on the driven shaft, the reducer comes in single and double reduction units. It easily adapts without disassembly to include back stops where reverse rotation is prohibited. (Allis-Chalmers Mfg. Co.)

For more data circle No. 48 on postcard, p. 109



(nylon), Teflon, Plaskon and other plastics. All components that come into contact with process fluids are of the same material. The non-rotating stem eliminates galling between the stem and valve seat. (Nuclear Products Co.)

For more data circle No. 46 on postcard, p. 109

Plastic Rod

Now in production as rod stock is a scratch and chemical resistant plastic. Previously available only as sheets, it now comes in clear thermosetting rods. Diameters include: $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, $1\frac{1}{2}$ and 2 in. Lengths are up to 36 in. The material has a methacrylate base with certain additives giving it very high abrasion resistance. It's unaffected by any known solvent. Rods withstand up to 230°F . For short periods, they

Stainless Steel

Corrosion and heat resistant, a new stainless steel is available in forging billets and rounds from $\frac{3}{8}$ to 3 in. Nickel content is low. Yet, it remains completely austenitic in all conditions. The strong, hard, erosion and oxidation and corrosion resistant material gives service of 900 to 1600°F . (Armco Steel Corp.)

For more data circle No. 49 on postcard, p. 109

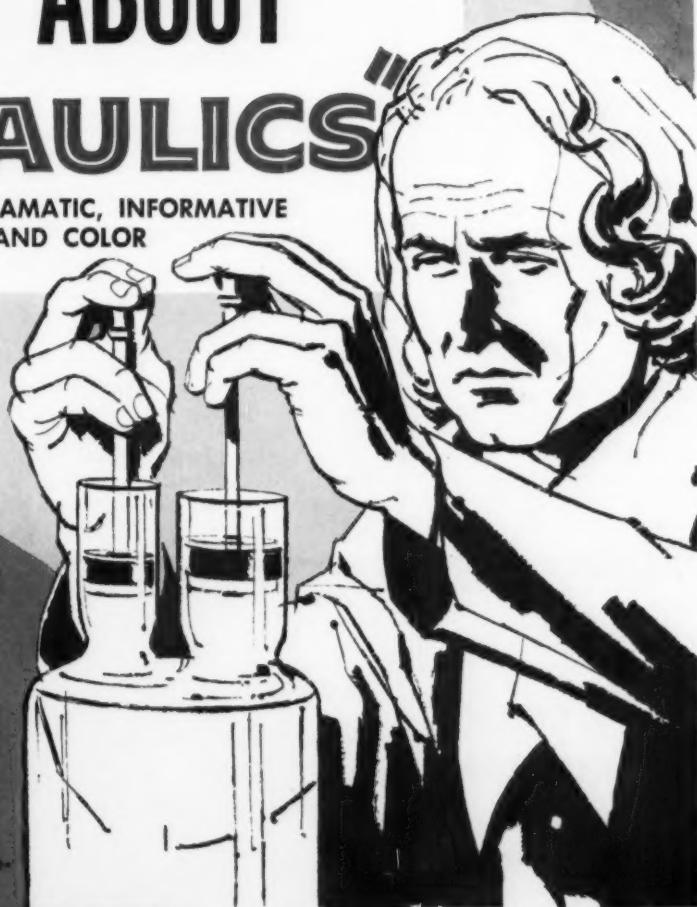
Chromium

Chromium is now available which contains no single metallic or gaseous impurity in quantities greater than 10 parts per million. (Chromalloy Corp.)

For more data circle No. 50 on postcard, p. 109

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REVEALS THE TRUE
FACTS ABOUT
"HYDRAULICS"

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die blocks

For the production of ferrous and non-ferrous forgings in drop hammers, forging presses, and forging machines, we supply five types of pre-hardened, ready-to-use die blocks, inserts, and tools in **SPECIAL MACHINING QUALITY** that is commercially machinable as *hard as 477 BHN* with modern, high-speed or carbon tools.

FX—die blocks, inserts and tools for an unusually wide variety of hot work applications, both ferrous and non-ferrous, where reasonable first cost and large volume production is important.

DURODI—die blocks, inserts and tools for a wide variety of closed die-forgings made on forging presses, hammers and

machines, involving unusual heat and abrasion problems.

CUPRODIE—die blocks for drop hammer and forging press applications, especially for light and medium weight forgings where long runs and high resistance to heat and abrasion are required.

SHELLEX—die blocks, inserts and tools for long run, close tolerance applications on forging presses, hammers and machines, requiring resistance to impact, shock, and sudden temperature change.

W4X—Inserts, tools and die blocks for close tolerance, long production runs of extrusion and forging presses, forging machines, and hammers.

forgings

"Forgings by Finkl" is synonymous with highest quality because our chromium-nickel-molybdenum heavy-duty forgings have the strength, stamina, and fatigue resistance to withstand the severe stresses and torsional strains encountered in modern heavy-duty machinery.

In addition to our CNM forgings, we are able to furnish forged products of AISI carbon and alloy steels, or many special analyses in the smooth forged, rough- or finish-machined condition.

Among the many specialties we have

produced from our MO-LYB-DIE processed alloys are:

- Repair parts for all types of forging equipment
- Containers, liners, and plungers for extrusion presses
- Crankshafts for trimming presses, punch presses, mechanical forming presses, nail machines, engines, and pumps
- Gear and pinion shafts
- Plastic mold, and die casting die blocks
- Cylinders

electric furnace steels



Finkl is one of the few heavy forge plants in the United States to operate its own electric melt shop. This modern, fully equipped shop makes possible not only better control of steel quality, but also more precise production planning of all

operations. Since each heat is melted and processed to meet a specific order or application, we can give individual attention to the particular requirements of each customer, thus assuring the best forging for your job.

A. Finkl & Sons Co.

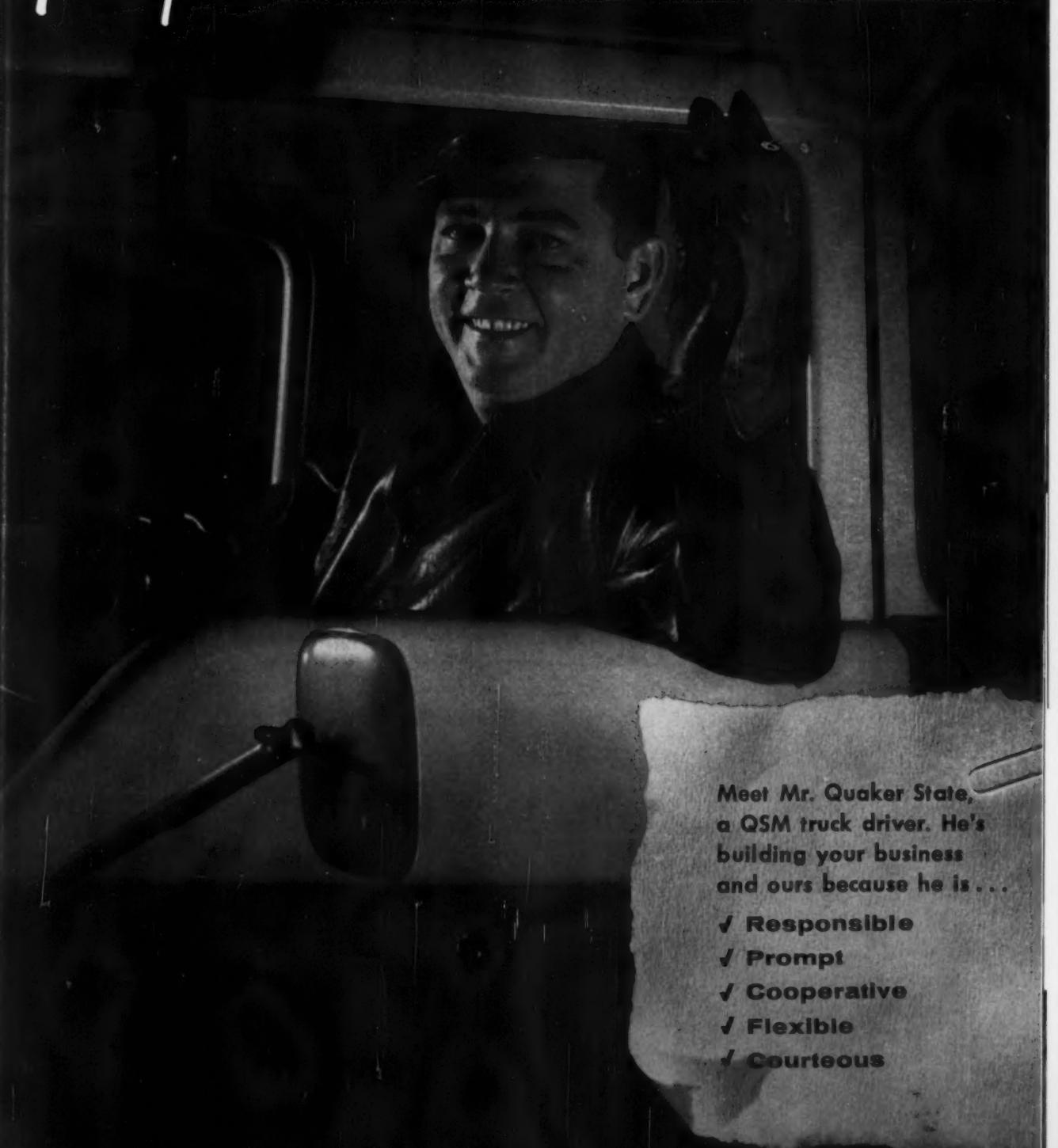
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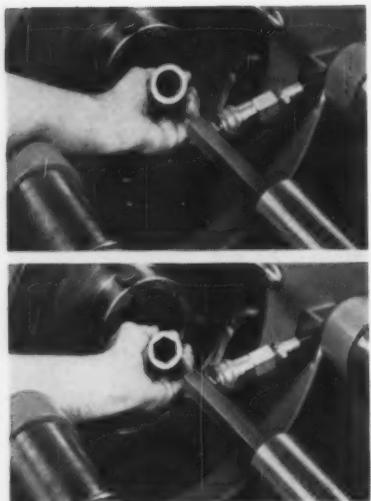
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MILL PRODUCERS OF ALUMINUM SHEET • COIL • TUBING • AND BUILDING PRODUCTS

New Production Ideas

Equipment, Methods and Services



Chipless Machining Produces Complex Pieces

Extremely complex inside diameters of cylindrical workpieces are formed quickly, accurately on this chipless machining unit. And it needs no expensive tooling. Operation is simple: Just place a piece of hollow cylindrical stock over a mandrel and inside a set of four forming dies. Start the machine. The dies, while revolving around the piece's outside diameter, pulsate rapidly. At the operation's end, the profile of the mandrel has been reproduced in the part's ID. Workpiece hardness, tensile strength and

finish are all improved. Profiles produced range from internal shapes where close tolerances aren't required to highly accurate lands and grooves in gun barrels. The machine forms highly complex inside shapes which would be physically or economically unfeasible by other methods. Materials handled range from copper through Zircalloy, including AISI 4140 to a 32 microinch finish. (Cincinnati Milling Machine Co.)

For more data circle No. 51 on postcard, p. 109

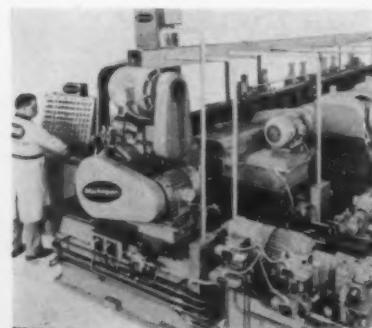


Steam Cleaner Is Safe, Quiet and Efficient

Steam cleaning of machinery and shop areas has many advantages. But some steam cleaning setups have disadvantages too, where fumes, smoke, flame or excess water are objectionable. Not so a new all-electric steam cleaner and generator. This unit is free from fumes or flame. What's more it has low water output and works with relative quietness. The portable unit handles light to medium cleaning

and sanitizing jobs, plus a new process which prevents flash rusting of machinery or equipment, imparting a gloss to many painted surfaces. Just 90 seconds after pressing the motor switch, turning on the heaters and setting the solution metering valve, the unit is ready to work. It comes in 55 models for 220 or 440-v plug-in service. (Homestead Valve Mfg. Co.)

For more data circle No. 52 on postcard, p. 109

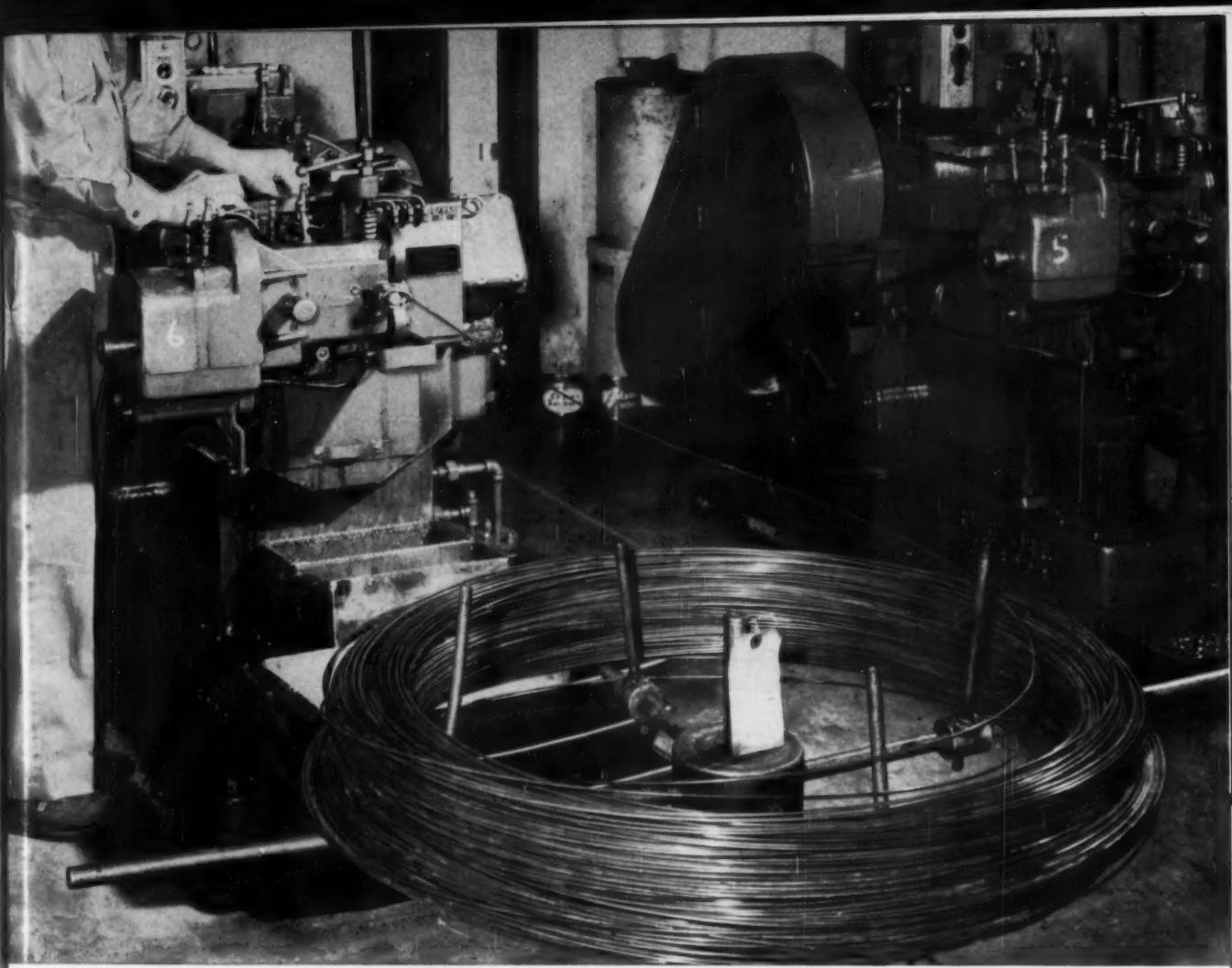


Setup Makes Five Bearing Caps From A Casting

Fully automated, this 19-station transfer machine produces automotive bearing caps. From a single, one-piece casting, it produces five finished bearing caps. Production rate is 75 castings (225 bearing caps) per hour at 100 pct efficiency. The horizontal and vertical in-line transfer setup is completely the work of one builder. Even the panel

board including installation of all wiring was designed and built by this manufacturer. All components are standard. The setup is designed to handle future model changes with a minimum of time and money for retooling. Each working station allows for individual cycling. (Michigan Drill Head Co.)

For more data circle No. 53 on postcard, p. 109



The high degree of plasticity of J&L special heading screw wire and its freedom from surface defects have virtually eliminated splitting problems for Midland Screw Corp.

At Midland Screw Corporation

J&L special heading screw wire solves tough recessed-head screw production problem

Midland Screw Corp. of Chicago, at its Millersport, Ohio, plant has found J&L special heading screw wire "... a consistently high quality product that we can depend upon."

Midland makes 4,500 kinds of screws, all to very close tolerances. The recessed-head types include round heads, oval heads, pan, flat heads, truss heads and others.

Recessed-head screws are tough to make because of the extraordinary demands on the steel wire during multiple heading operations. The wire must have a high degree of hardness. And, *after* it has become even harder from the initial cold heading blows, it must have enough plasticity to take the final indent.

The wire must be free from harmful surface defects. Since the pressures involved alone are sufficient to cause serious splitting with ordinary heading wire, any seaminess can accentuate this problem.

Midland also uses J&L special heading screw wire for other screws with heads that are difficult to form. One of these, made from .133-inch wire, is an indented hexagonal washer head. The washer on the finished screw is .370 inch—or almost three times the diameter of the wire.

For more information on J&L special heading screw wire, call your J&L representative. Or write to Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.

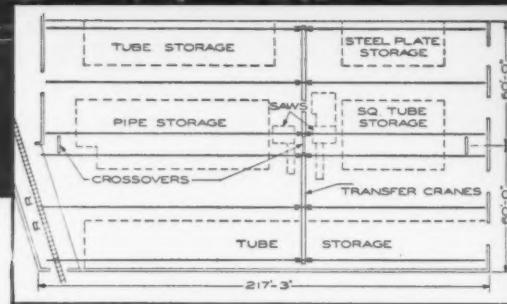
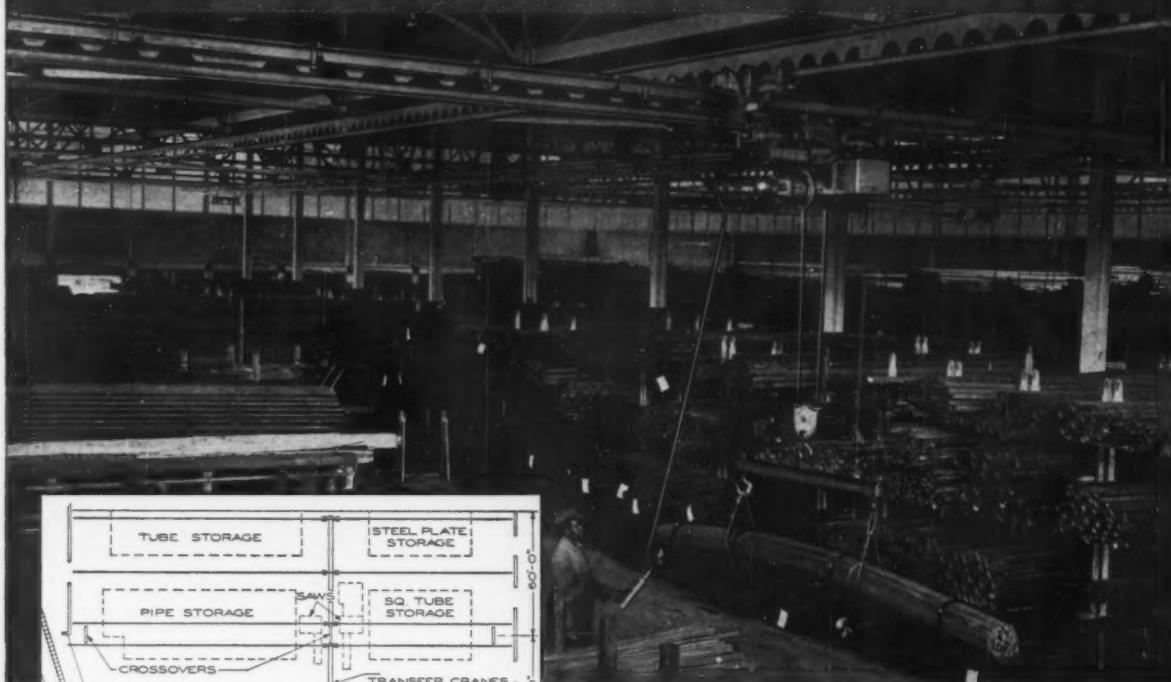


Midland makes recessed-head screws at rates up to 13,800 per hour on each machine by using J&L special heading screw wire.



The exciting new J&L
Jones & Laughlin Steel Corporation
PITTSBURGH, PENNSYLVANIA

TRAMRAIL TRANSFER CRANES SYSTEMATIZE HANDLING IN STEEL WAREHOUSE



A LARGE modern warehouse at Atlanta, Georgia, was designed to make use of overhead Tramrail equipment to enable the handling of large unit loads in and out of storage with the least effort and in the quickest time.

The principal storage section is provided with two parallel runways each having three tracks. On both runways is a 64-foot transfer crane that travels the length of the room. Cross-overs are provided, enabling a hoist carrier transferring from one crane to the other. This makes it possible to haul materials between any two points in the entire area without rehandling.

Steel is constantly on the move in this active

The large storage area is completely covered by Tramrail crane service. Every item can be seen from the floor and readily reached with the two transfer cranes.

The Tramrail transfer cranes make it easy to place the long unwieldy pipes and bar stock into storage at any height. This makes for orderliness, which is an important factor in securing high operating efficiency.

plant. From 60,000 to 70,000 lbs. are brought in by railroad car daily and like amounts are shipped out. The material is unloaded from railroad cars at one end of the building and placed into storage. It is shipped out on trucks which are loaded at the other end.

The overhead crane system makes it possible to place incoming materials into allotted storage spaces at once. The need of storing temporarily in aisleways or other areas and extra handling which this entails is eliminated. Thus, the warehouse is kept orderly at all times and every item is readily seen and conveniently reached. Danger of handling accidents is minimized and overall efficiency is unusually high.

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THE CLEVELAND CRANE & ENGINEERING CO.
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CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

NEWS FOR HEAVY FORGE SHOPS

Green River Steel
can now offer
forging blooms
up to 18" square
with guaranteed
sound centers

To answer the consistent need of many good customers, Green River has developed new production techniques which allow it to guarantee sound centers in forging blooms with cross sections up to 18 inches square. These blooms are available in aircraft and commercial grade alloy, stainless or forging quality carbon steels. Each bloom is tested for soundness before shipment, but Green River's patented Macro-Clean process makes rejects extremely infrequent. For further information, contact Green River at Owensboro, Ky., Jessop at Washington, Pa., or one of the Jessop offices or representatives shown at the right.

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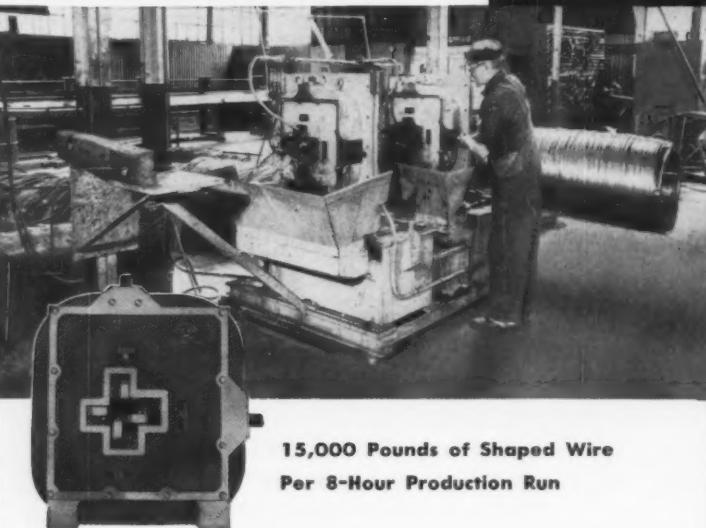
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A SUBSIDIARY OF JESSOP STEEL COMPANY

Wire Shaping

**BETTER, FASTER
at LOWER COST**



**15,000 Pounds of Shaped Wire
Per 8-Hour Production Run**

The Fenn 4U Universal Type Tandem Turks Head is shown in use at The National Lock Washer Company in Newark, New Jersey. Prior to being formed into lock washers and retaining rings, the wire is drawn through the tandem Turks Head for a two-step reduction which in this case results in a keystone-shaped cross section. The Shaped Wire Division of National Lock Washer, 100% equipped with Fenn Turks Heads, turns out 10,000 to 15,000 pounds of shaped wire every 8-hour production run with only three operators required to maintain this high production rate. Fenn Turks Heads may be used singly, in tandem as illustrated, or in tandem with a rolling mill or draw bench. For complete information on the capabilities, advantages and capacities of the four basic types of Fenn Turks Heads, send today for the new illustrated Turks Head Catalog No. TH56.



Turks Heads

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TO KEYSTONE



IN A
SINGLE PASS



NEW BOOKS

"How to THINK About Public Relations", though very brief, says all some executives need know about PR. It's akin to putting PR into a hypodermic and getting a "shot" of it. In this age of "impress the boss or client" reports—patting him on the back, snowing him under with long, complex analyses, words and sentences—this work is a refreshing change. It begins by stepping all over toes (e.g., "Most executives don't know much about public relations . . . they don't have the background . . . to think effectively in this area"). Even old pros get a broadside: "A substantial part of (big PR-program) expenditure is wasted." In short, it's an objective, constructive criticism and flash review of corporate PR, or lack of it. Well written in ordinary English, it quickly innoculates busy executives with PR. Once vaccinated, the fever can spread, even becoming contagious. It may lead the reader's company into more extensive PR literature. Don't measure this report by size or price per page, but by potential goodwill and dollars it can get and save for you. 46 pp. \$25 per copy. The Economics Press, Inc., Montclair, N. J.

"Descaling & Cleaning of Titanium Alloys" relates results of studies at Battelle Memorial Institute. One fact learned: Acid pickle baths clean well up to 1100°F; over this heat more drastic removal treatment is necessary. Various descaling processes are reviewed. 68pp. \$1.75 per copy. PB121640. OTS, U. S. Commerce Dept., Washington 25, D. C.

"Powder Metallurgy in Nuclear Engineering," by Dr. H. H. Hausner, has 15 chapters on metallurgical problems in the design of nuclear reactors. 275pp. \$8.50 per copy. American Society for Metals, Book Dept., 7301 Euclid Ave., Cleveland 3, Ohio.



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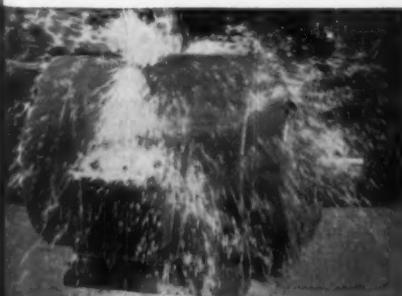
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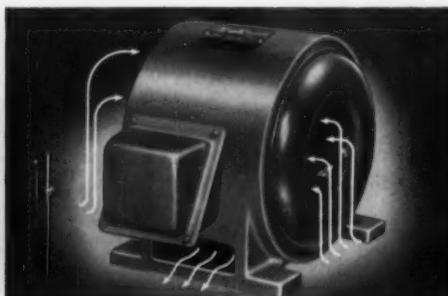
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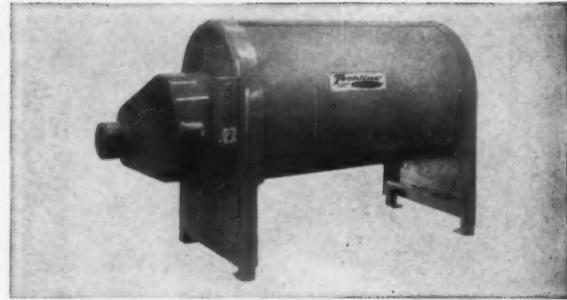
A leading aircraft and missiles parts manufacturer (below) uses Techline barrel equipment for finishing to ".0001" tolerances. A Techline-Liquamate cabinet (top) wet-blasts marine diesel engine cylinder liners prior to chrome plating.



If you want a lower-cost method of obtaining the precise finishing results you need, call on Techline — where precision finishing is a science.



Techline shatters an industry's traditions — makes precision finishing a science.



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You-asked-for-them features are evident in the design of all Techline equipment. Model 30, for example, is typical of Techline standard barrel finishing machines. It comes in 20 sizes having 1 to 6 compartments, from 5 to 30 cu. ft. capacity.

New ideas include the streamlined styling, "good-house-keeping" design leg supports, retractable fiberglass safety gate, safety switch, and centralized, push-button control panel. Full-opening doors make loading, unloading and cleaning operations easier. Cylinder shafts, machined after they are welded into position, assure positive alignment and balance, promote noiseless, vibration-free operation. For full details, write for our new Bulletin No. 200.

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Techline specialists have simplified your problems of selecting compounds for precision barrel finishing, with the Techline line of Chempounds. Instead of 15 or 20 formulas, Techline has developed nine standard Chemical compounds which meet the bulk of all barrel finishing needs.

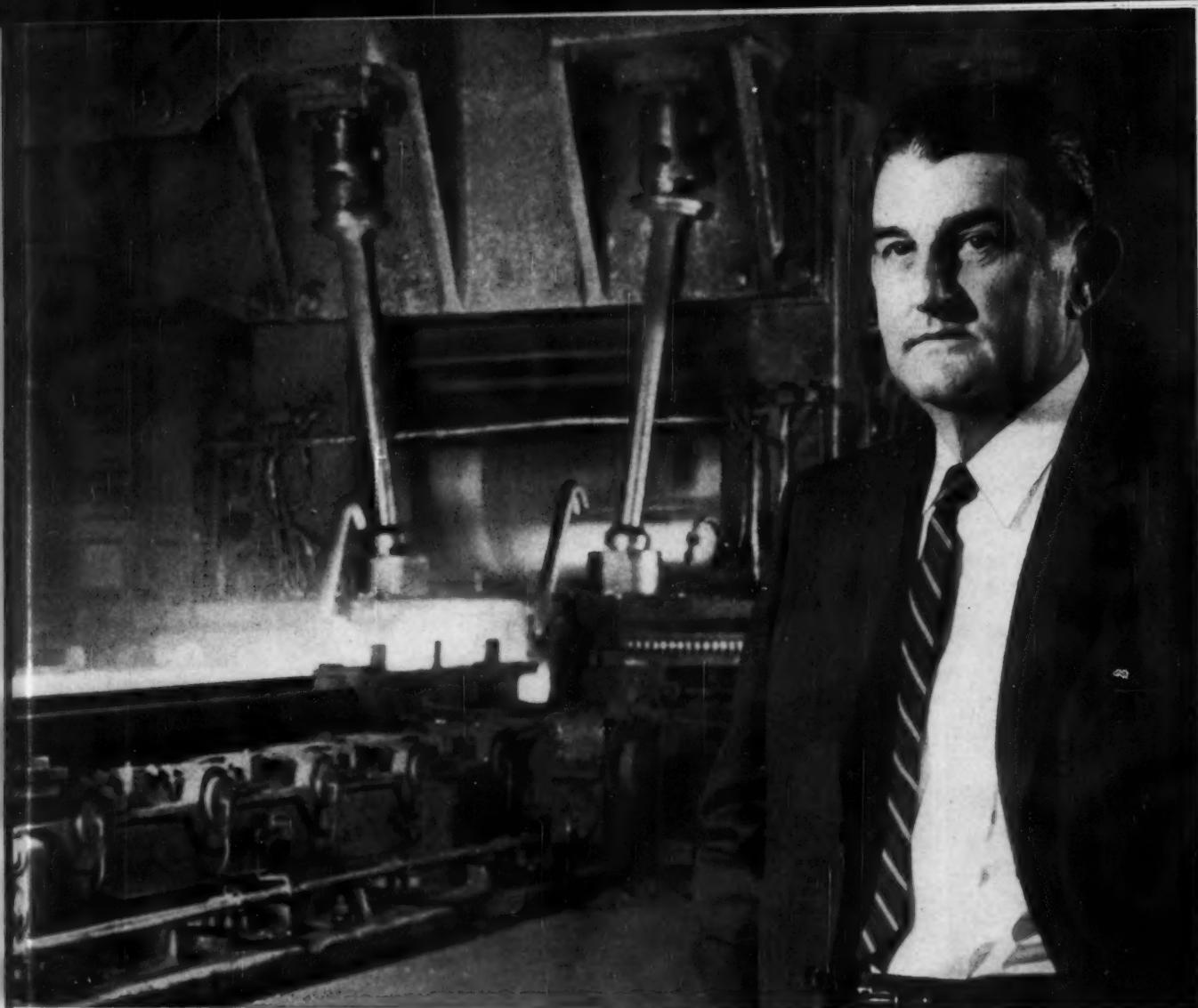
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2450 Avenue V, Vicksburg, Michigan

THE IRON AGE, January 29, 1959



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says Deac Scholl, manager of roll sales

"The new building, new equipment and new processes included in the expansion of National's roll-making facilities have resulted in a more complete line of longer-life steel rolls for our increasing number of steel roll customers.

"The expansion embraces all phases of production from pouring to machining. For instance . . . with the new facilities, including the newest type electric furnaces, we can now pour and machine steel rolls, both plain and grooved, in a wide range of sizes.

"And in addition, we have increased sales and service personnel, so we can give you, as never before, in-plant attention to your roll problems.

"Our staff members have had years of experience in the roll, steel foundry, and other metallurgical fields. They are well aware of the many metallurgical and rolling problems that occur; and recognize that selection of the correct roll—whether iron, nodular iron, or steel—can be of extreme importance.

"Let us study your problem and give you our recommendations for its solution."



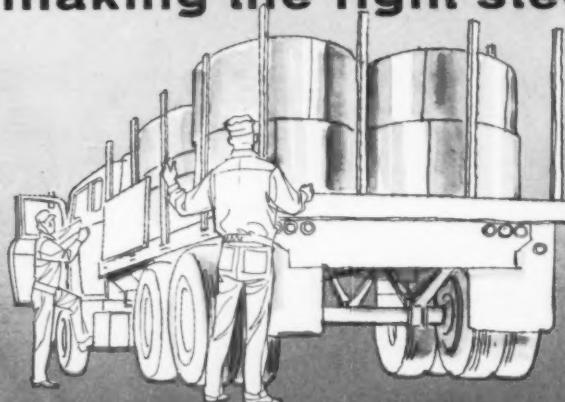
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The Iron Age Summary

It's Tough to Build Inventory

Steel users are doing their best to rebuild stocks as a strike hedge.

Some will make grade, notably big users and those who started early. But others will have a hard time of it.

■ Will steel users be able to build up much of an inventory hedge against the possibility of a steel strike at mid-year?

Some of them will—the big steel users, and the smaller ones who started out early to reserve space on mill order books. Others will have a hard time of it.

Use Versus Output—Still others don't seem to be much concerned about rebuilding steel stocks. Their reasons for this are valid. Either they feel their own business prospects do not warrant much of a buildup, or they feel the heavy investment in inventory is too much to carry. So they're hoping to ride out a strike—if one comes.

There's still another angle to the steel inventory outlook. Some market analysts look at it this way: Industry is now chewing up about six million tons of steel a month. This is likely to move up to 6.5 million tons by summer. They say the most industry can add to inventories by June 30 is about six million tons. Even if there is no strike, they add, the June inventory level will not be high in relation to consumption at that time.

Working Both Ends—Meanwhile, many steel users are playing both ends against the middle in their drive to rebuild stocks. They're ordering steel for second quarter delivery and at the same time placing orders for first quarter.

May is the key month. Customers are trying to book tonnage there and working backwards through April and March. The outlook is for plates, wide flange beams, and all flat-rolled products—sheets, strip, and coated sheets—to be booked to capacity.

Big Auto Push—The auto companies are aiming to lay in enough steel to last them through the current model year and give them a start on the 1960 models. They also told their suppliers to stock up on steel on the same basis. Where suppliers are not anxious to build inventory, the automakers are guaranteeing them they won't be stuck with a lot of steel if there is no strike.

Steel companies are studiously avoiding use of the word "allocation" to describe their efforts to keep order books under control. But that's what it amounts to. The mills are taking a close look at new business.

Order Volume High—Some mills are describing the current market picture as somewhat like that of 1955, a reaction to the recession of 1954. One Cleveland sales office recorded its biggest daily order volume in at least five years. It may be several weeks before mill scheduling departments restore some semblance of order.

Steel Output, Operating Rates

Production (Net tons, 000 omitted)	This Week	Last Week	Month Ago	Year Ago
Ingot Index (1947-1949=100)	138.3	128.6	133.9	90.8
Operating Rates				
Chicago	90.0	86.0*	83.0	59.0
Pittsburgh	74.0	68.5*	74.0	58.0
Philadelphia	82.0	75.0*	74.0	63.0
Valley	62.0	55.0*	69.0	45.0
West	86.0	85.0	76.0	65.5
Cleveland	86.0	79.0*	80.0	34.0
Buffalo	78.0	71.0	66.0	54.0
Detroit	95.0	96.0	94.0	51.0
South	72.0	71.0	72.0	52.0
South Ohio River	88.0	81.0*	83.0	59.0
Upper Ohio River	82.5	73.0*	84.5	58.5
St. Louis	93.0	84.0*	97.0	78.0
Aggregate	78.5	73.0	76.0	54.1

*Revised

Prices At a Glance

	This Week	Week Ago	Month Ago	Year Ago
(Cents per lb unless otherwise noted)				
Composite price				
Finished Steel, base	6.196	6.196	6.196	5.967
Pig Iron (gross ton)	\$66.41	\$66.41	\$66.41	\$66.42
Scrap No. 1 hvy (Gross ton)	\$42.50	\$41.17	\$39.83	\$35.00
No. 2 bundles	\$29.33	\$29.17	\$29.00	\$27.17
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	28.10
Copper, electrolytic	29.00	29.00	29.00	25.00
Lead, St. Louis	11.80	12.80	12.80	12.80
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	99.875	99.875*	...	91.625
Zinc, E. St. Louis	11.50	11.50	11.50	10.00

How Defense Funds Will Be Spent

Don't look for any sharp increase in military purchasing unless Congress acts to pad out President's budget.

Present plans call for only a 1 pct boost in spending in year beginning July 1.

■ Military buying will stay at about present levels in the year beginning July 1. That is unless Congress acts to pad out the President's new budget.

Only Up 1 Pct—Actual military purchasing under the Eisenhower budget calls for only a \$119 million increase in spending. This is less than 1 pct of total procurement, research, and development spending. And it probably represents an expected inflation in prices more than an increase in buying volume.

When Congress starts to pick at the President's military budget, Capitol Hill sources expect most of the

pressure for higher spending to come in the missile, research, and atomic fields.

Targets for Congress—There will be a strong drive to put back into the budget some \$100 million or more to turn the Navy's new carrier into an atomic-powered ship.

There is also a drive for a sharp hike in funds for an atomic-powered plane—an off-again, on-again program already scheduled for some increase this year.

The Navy Polaris sub program may also be the subject of a drive for extra funds.

Missile Emphasis—While the largest amount of the \$3.3 billion scheduled for research and development will go for missiles—both military and civilian research—one of the strongest moves will be to boost this spending. An increase of half-a-billion dollars or so in funds allotted by the President for satellite and outer space activities is a possibility.

Spending for Air and Sea . . . By dollar totals, the new procurement budget will spend \$6.2 billion for new aircraft, down \$700 million from the current year; \$3.8 billion for missiles, up \$507 million; \$1.5 billion for ships, about the same as this year, and \$2.1 billion for "other items," including conventional tanks, trucks, and weapons.

. . . **And Elsewhere**—Under research, development, test, and evaluation—most of which will go into the missile program—the President is asking for \$3.3 billion. This is an increase of \$364 million over this year, and includes a great deal for test and research equipment and facilities.

Much of the spending dollar in the new year will go for electronics and communications equipment, particularly for air defense. The Army is planning an increase in purchases of trucks and tanks, along with new types of rifles and machine guns.

How Defense Buying Pattern Changes

New weapons and new strategy alter the pattern of military buying. Here's how these changes are reflected in the new defense budget:

Aircraft—More spending for jet bombers and jet tankers. Less spending by the Air Force for fighter-bombers and interceptors. The reason: Greater reliance on interceptor and ballistic missiles.

The Navy wants more fighter planes, fewer attack planes. The Army is calling for more observation planes. More funds are asked for the B-70 intercontinental jet

bomber and for a new, high speed, long-range interceptor.

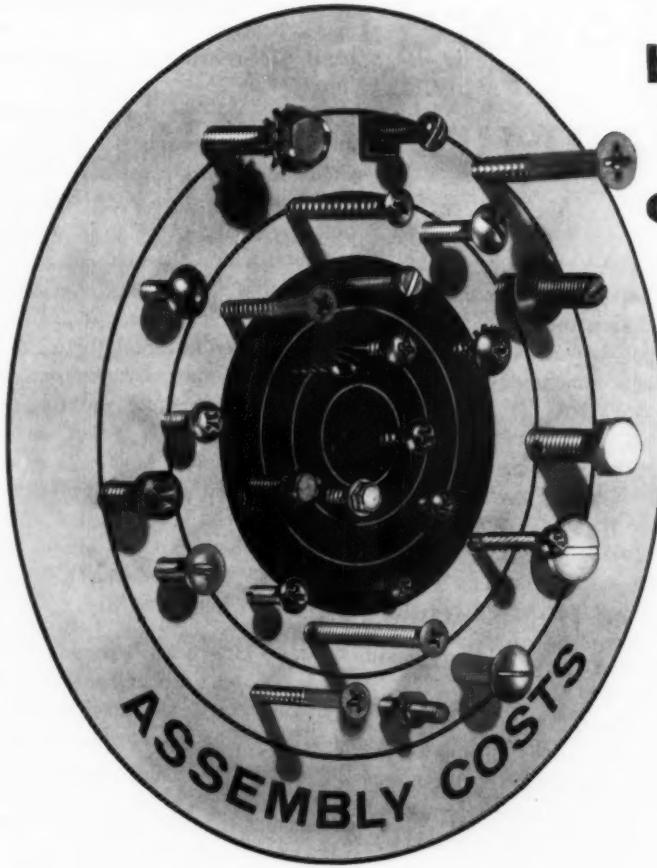
Missiles—Spending for missiles and missile work is beefed up. In all, some \$800 million more is provided for missile programs.

Boosts are included for development of the Titan and Polaris missile systems. More funds are provided for the Minuteman—an advanced or second generation missile. There are increases for the Thor and Jupiter programs, as well as the defensive Bomarc, Nike-

Hercules, and Hawk interceptors. Continuing funds are listed to develop the Atlas and Polaris systems.

Ships—Funds are included for three more submarines capable of firing the Polaris missile. Money is available for advance purchasing on other missile subs which will be started in 1961. Also in the new budget: Appropriations for a super-size Forrestal class carrier, six guided missile destroyers and frigates, three nuclear-powered attack submarines, and a converted guided missile cruiser.

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Continental can supply any recognized standard type, style or size. Also, many fasteners ordinarily considered "specials" are available among the millions of screws constantly in stock to meet needs of Continental customers.

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Continental is known throughout industry as the "specialist in specials," — leads in production of special designs. Continental is also your supply source for special-purpose fasteners, such as HOLTITE NYLOK Self-locking Screws.

**MORE "SPECIAL"
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Market Heads Toward 2nd Quarter Jam-up

Buying fever mounts as more users try to build up their stocks.

Mill delivery estimates on sheet and bar stretch out in most markets.

■ In the second quarter the market will be tighter than an over-packed suitcase.

These current trends point toward that condition:

(1) More strike hedge buying. Larger numbers of steel users are trying to build stocks against a possible strike at mid-year. Generally they are increasing their orders for sheet, strip, and bar. In some cases pipe and wire are included. So far largely immune to this hedge buying: Plates and structurals.

(2) Greater steel needs. Even allowing for strike hedging there's more strength in the market. Auto and appliance manufacturers are

increasing their steel tonnages. Sales of tool and specialty steels are improving. Stainless orders are better.

(3) Longer deliveries. Mill shipping estimates are moving upward in all areas except the East and West Coast. (See table below.) Sheet, strip, and bar are the products most affected. Average increases since the last IRON AGE report are two weeks at Chicago, three weeks at Detroit, and four weeks at Cleveland. At Pittsburgh there are gains of two weeks for cold-rolled sheet and strip, and hot-rolled bar.

(4) Allotments. Most mills are now on some form of allocation for cold-rolled sheet. Coated sheet products have been on a quota basis for several months. Generally mills prefer to say they are "screening orders," "checking former buying patterns," and "controlling bookings." But, in any case they are re-

viewing all second quarter tonnages with care before booking them.

Sheet and Strip—Most producers are handling cold-rolled sheet orders on some sort of allocation basis. Hot-rolled sheet is in better supply.

Chicago remains the most critical market area for sheet and strip. Cold-rolled sheet mills there will go into February with a carryover of four to six weeks on orders. Strip mill books are filling up at a fast rate for the second quarter. Galvanized sheet, terne plate, and enameling iron are on informal quotas.

Auto steel buyers have touched off a wave of sheet ordering at **Cleveland**. One automaker asked for three times the normal monthly tonnage. Non-automotive buyers then got active. As a result, most mills are just about sold out on cold-rolled sheet for March. Some are booked solid into May.

Bar—Hot-rolled bar deliveries are lengthening at **Pittsburgh** and in the **Midwest**. Mills believe users are finally building inventories. At **Chicago** some mill rolling cycles have moved up from 45 to 60 days. This means some users must wait eight weeks for delivery rather than a former four to six weeks.

Pipe and Tubing—Orders for oil country seamless are increasing. Some of the shipments are going to jobbers building stocks against a spring buying rush. Continuous weld pipe for home construction is moving well. However, distributors are doing little hedge buying. Large diameter welded pipe is still slow with most mills producing at about 20 or 30 pct.

Wire Products—Orders for manufacturer's wire are picking up steam with auto suppliers, fastener makers, and furniture builders responsible. Wire mills are concerned about second quarter ordering. Reason: The normal seasonal increase in merchant wire orders may be coupled with some hedge buying. With a continued good market for manufacturer's wire this could add up to a tight supply situation.

Delivery Promises at a Glance

	East	Pittsburgh	Cleveland	Detroit	Chicago	West Coast
CR Carbon Sheet	5-6 wks	7-8 wks*	8-12 wks*	6-10 wks*	10-12 wks*	6-7 wks
HR Carbon Sheet	3-4 wks	3-4 wks	6-10 wks*	5-8 wks*	10-11 wks*	4-5 wks
CR Carbon Strip	5-6 wks	7-8 wks*	8-12 wks*	6-10 wks*	8-10 wks*	4-6 wks
HR Carbon Strip	3-4 wks	3-4 wks	6-10 wks*	5-8 wks*	3-6 wks	4 wks
HR Carbon Bars	2-4 wks	3-6 wks*	7-8 wks*	2-5 wks*	6-9 wks*	2-3 wks
CF Carbon Bars	1-4 wks	2-4 wks	2-3 wks	2-5 wks*	5-9 wks*	2 wks
Heavy Plate	2-3 wks	1-4 wks			10-12 wks*	4-6 wks
Light Plate	2-3 wks	1-2 wks	6-10 wks*		8-10 wks*	4-6 wks
Merchant Wire	Stock	1 wk	1 wk		2-6 wks*	3-4 wks
Oil Country Goods	Stock	Stock	4 wks*		2-5 wks*	
Linepipe	Stock	2-8 wks	Stock		2-5 wks†	4-6 wks
Buttweld Pipe	Stock	Stock	Stock	Stock	3-5 wks	2-4 wks
Std. Structural	2-4 wks	1-4 wks		2-6 wks*	2-6 wks	4 wks
CR Stainless Sheet	2-4 wks	1-4 wks	4-6 wks*	2-5 wks		
CR Stainless Strip	2-4 wks	1-4 wks	4-6 wks*	2-5 wks*		

* Delivery promises have lengthened since 12/25/58.

† Delivery promises have shortened since 12/25/58.

COMPARISON OF PRICES

(Effective Jan. 27, 1959)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	Jan. 27 1959	Jan. 28 1959	Dec. 29 1958	Jan. 28 1958
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	4.925¢
Cold-rolled sheets	6.275	6.275	6.275	6.05
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.80
Hot-rolled strip	5.10	5.10	5.10	4.925
Cold-rolled strip	7.425	7.425	7.425	7.17
Plate	5.30	5.30	5.30	5.12
Plates, wrought iron	13.55	13.55	13.55	13.15
Stain's C-8 strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$10.65	\$10.65	\$10.65	\$10.30
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.00
Special coated mfg. terne	9.90	9.90	9.90	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.425¢
Cold finished bar	7.65	7.65	7.65	7.30
Alloy bars	6.725	6.725	6.725	6.475
Structural shapes	5.50	5.50	5.50	5.275
Stainless bars (No. 302)	46.75	45.00	45.00	45.00
Wrought iron bars	14.90	14.90	14.90	14.45
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	7.65¢
Rails: (per 100 lb.)				
Heavy rails	\$5.75	\$5.75	\$5.75	\$5.525
Light rails	6.725	6.725	6.725	6.50
Semifinished Steel: (per net ton)				
Rerolling billets	\$80.00	\$80.00	\$80.00	\$77.50
Slabs, rerolling	80.00	80.00	80.00	77.50
Forging billets	99.50	99.50	99.50	96.00
Alloy blooms, billets, slabs	119.00	119.00	119.00	114.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.15¢
Skelp	5.05	5.05	5.05	4.875
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	5.987¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Jan. 27
1959

Jan. 29
1959

Dec. 29
1958

Jan. 28
1958

Pig Iron: (per gross ton)

Foundry, del'd Phila.	\$70.57	\$70.57	\$70.57	\$70.51
Foundry, Southern Cin'ti	73.87	73.87	73.87	71.65
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.01
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	65.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb:				
	12.25	12.25	12.25	12.25

Pig Iron Composite: (per gross ton)

Pig iron	\$66.41	\$66.41	\$66.41	\$66.42
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Scrap: (per gross ton)

No. 1 steel, Pittsburgh	\$45.50	\$45.50	\$42.50	\$33.50
No. 1 steel, Phila. area	38.50	35.50	33.50	38.00
No. 1 steel, Chicago	43.50	42.50	43.50	33.50
No. 1 bundles, Detroit	38.50	36.50	35.50	23.50
Low phos., Youngstown	47.50	46.00	44.50	36.50
No. 1 mach'y cast, Pittsburgh	51.50	51.50	50.50	49.50
No. 1 mach'y cast, Phila.	56.50	48.50	48.50	47.50
No. 1 mach'y cast, Chicago	56.50	54.50	53.50	47.50

Steel Scrap Composites: (per gross ton)

No. 1 hvy. melting scrap	\$42.50	\$41.17	\$39.83	\$35.00
No. 2 bundles	29.33	29.17	29.00	27.17

Coke, Connellsville: (per net ton at oven)

Furnace coke, prompt	\$14.50	\$14.50	\$14.50	\$15.38
Foundry coke, prompt	\$18-18.50	\$18-18.50	\$18-18.50	\$17.50-19

Nonferrous Metals: (cents per pound to large buyers)

Copper, electrolytic, Conn.	29.00	29.00	29.00	25.00
Copper, Lake, Conn.	29.00	29.00	29.00	25.00
Tin, Straits, N. Y.	99.875†	99.875*	99.875*	94.00
Zinc, East St. Louis	11.50	11.50	11.50	10.00
Lead, St. Louis	11.80	12.80	12.80	12.80
Aluminum, virgin ingot	26.80	26.80	26.80	28.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	33.00

† Tentative. * Average. * Revised.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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**KENCO 5 TON PRESS MAKES
LONG RUN WITH 18" DIE!**



Fully Supported Ram — Extra Rigidity of Kenco Frame Pay Off in Longer Die Life and Greater Die Capacity

A leading manufacturer of aluminum doors profitably employs the extra capacity of a Standard 5 ton Kenco Press to manufacture Door Guards. Fabricating the Door Guard Assembly is done in an 18" wide die ordinarily requiring a considerably larger press. Kenco's greater strength and wider frame account for this job having run for three years with only nominal die wear. Kenco's extra capacity eliminated the need to buy a heavier press.

JOB FACTS:

Machined: Two 5 ton Kenco Series 5N (standard) Presses. Placard: Aluminum Tubular Door Guard Assembly. Sequence of Operations: Press No. 1 — Flatten Tube ends.

Press No. 2 — Pierce 10 holes in tube ends and channel reinforcing, 5 per end; 18" wide die required.

Production Rate: 30 Door Guard Assemblies per hour.

Fully Guided Ram is contained in extra long V guides preventing tilting of ram. This explains why the Kenco 5 ton press does an outstanding job with an 18" wide die. Solid, heat treated steel crankshaft is free of weakening slots and offers the strongest possible construction.

NEW BULLETIN—Write for our new literature describing Kenco Press features and complete specifications. No obligation.



5211 Telegraph Rd., Los Angeles 22, Calif. The Most Complete Line of Small Punch Presses in the World

2 Ton 5 Ton 8 Ton 15 Ton Deep Throat Electro-Safe Specials Slow Speeds

New Strength Behind Rising Prices

Inventory building by auto-makers and others will add to higher scrap prices.

Export is picking up, foundry grades are moving better, turnings show signs of life.

■ Pressure for higher prices continues to build up in most major markets.

The rate of climb slowed down, for the time being, in the Pittsburgh district. But Chicago openhearth prices moved up \$1 and the Philadelphia market shot up \$3 following several sales in rapid succession.

Prices in the East had been lagging behind Pittsburgh and the Midwest, but out-of-district orders and new export business forced eastern Pennsylvania mills to raise their bids in order to keep good scrap from leaving the district.

Now a sudden surge of inventory building by auto companies is expected to touch off another round of scrap increases. The Detroit market responded first this week with a \$2 increase in openhearth scrap.

Industrial lists generally are bringing higher prices, and the top is not yet in sight for these grades.

New foundry activity is adding strength to cast iron and foundry steel. Turnings are also affected by the surge in steelmaking activity. Higher prices were reported from Pittsburgh, Philadelphia, New York, Cincinnati, and Detroit.

Based on increases in Chicago and Philadelphia, The IRON AGE No. 1 heavy melting Composite Price climbed \$1.33 to \$42.50.

Pittsburgh—The market is strong but uneven here. One mill placed an order for No. 1 heavy melting at prices ranging from \$43 to \$45, for No. 2 heavy melting at \$36 to \$39, and No. 2 bundles at \$32 to \$34. The order drew some scrap from out-of-district but it quickly skimmed off the amount of material that was available at low prices. Brokers are now turning down offers from another consumer to buy No. 1 heavy melting at \$46. On the other hand, No. 2 bundles can still be pulled in at prices equal to \$33 or less. Industrial and railroad grades are expected to move up sharply on the next lists.

Chicago—No. 1 heavy melting is up \$1 to \$43-\$44 on basis of a sale. The same mill bought 5000 tons of factory bundles for \$48, which is 50¢ higher than the last sale reported two weeks ago. In response to a number of requests, 3 ft low phos has been replaced by 2 ft low phos. Owing to a split pricing situation, the heavy breakable cast grade is being dropped.

Philadelphia—This market is more active than it has been in many months. Sale of No. 1 and No. 2 heavy melting last week at \$2 higher prices was followed this week by another sale that topped last week's by a \$1. It brought the total price jump to \$3 this week. No. 1 busheling sold at \$40, equal to the price for No. 1 bundles. Turnings also moved up \$3. Adding to the local strength are out-of-district orders and new export business.

New York—Steelmaking and blast furnace scrap prices rose \$1 on the basis of new buying by eastern Pennsylvania mills, bringing No. 1 heavy melting to a top of \$29. Export also is reviving.

Detroit—Dealers are anticipating a stronger market for next month on word the auto industry is swamping steelmakers with inventory-building orders.

Cleveland—Market is up \$1 on prime grades based on broker quotations for the Valley. Cleveland continues to lag. Auto lists are up \$2 on appraisal and could go higher.

St. Louis—Prices moved up \$1 for openhearth grades on strength of anticipated sales. No. 1 railroad heavy melting was sold at \$45, a \$1 increase, and angles and splice bars sold for \$49, up \$2.

Birmingham—Prices of most items are holding steady here. A strike at an Atlanta mill and nominal interest from a large Alabama openhearth consumer has kept the southern market from advancing in line with other areas.

Cincinnati—Market is up \$2 on early broker bidding in anticipation of a rush in February. Area mills are expected to be in market at higher prices.

Buffalo—Only activity here was a sale of cupola cast at quoted prices.

Boston—Prices are firm, although the market is quiet. New business is expected here soon.

West Coast—The market remains dull. Much talk persists that the Japanese will enter the market for substantial tonnages.

Houston—Prices are unchanged. The outlook in the local market has worsened some. The district mill apparently has no plans for purchasing scrap for February and will continue tapping its large inventory.

LEDLOY*

Free Machining Steels for forgings

METALWORKING SHOPS FIND LEDLOY* STEEL FORGINGS SAVE TIME...TOOLS...FINISHED PART COSTS!

LEDLOY

Metalworking shops in ever increasing number are specifying *Ledloy* steels in forgings. The trend started when it was found that forged parts made with *Ledloy* steels resulted in savings far surpassing the original higher cost of the forging. *Ledloy* is widely known as Inland Steel Company's trade name for any grade of steel to which lead has been added to obtain greater machinability. Forgings made from *Ledloy* steels can be heat treated and forged in exactly the same manner as similar non-leaded grades of open hearth steels, while machinability is increased up to 50% in many applications.

Thus, regardless of grade of steel in use currently for your product, if machining is an important part of the fabricating process, the experience of hundreds of metalworking plants has proven that a change to a similar *Ledloy* grade can definitely cut total machining cost in many cases.

cost-cutting factors:

Increased machinability, higher speeds and feeds, easier tolerance control, reduced tool wear, less downtime, greater production per tool change and fewer finishing operations.

Although it is well known that *Ledloy* Grade A can be machined 45% faster than B1113 and *Ledloy* Grade B 100% faster than B1112, it is not as widely realized that forgings made of *Ledloy* steels can show similar startling results. If present equipment is not being run at highest potential speeds, considerable savings can result using *Ledloy* grades and taking advantage of their much greater machining rate. Surface speeds of 325 feet per min. are common and much higher speeds are possible—up to 450 sfm with high speed tools and up to 600 sfm with carbide tooling when using Grade A *Ledloy* steel.

If current operations wear tools excessively, necessitating frequent tool changes, or if tooling cost is relatively high, *Ledloy* steels can effect significant savings. Because the Inland process of adding lead to steel lowers the steel's frictional component, less heat is generated during machining. *Ledloy* steel's shorter-length chips quickly fall clear of the tools, and tool-edge build-up is minimized. The end result, clearly discernable, is far greater production, less down-time for tool changes and a welcome reduction in total machining cost. *Ledloy* steel's lubricating and better-chip-forming qualities make it the fastest machining steel in the world. The superior surface finish obtainable with leaded steels can often result in the elimination of one or more subsequent finishing operations.

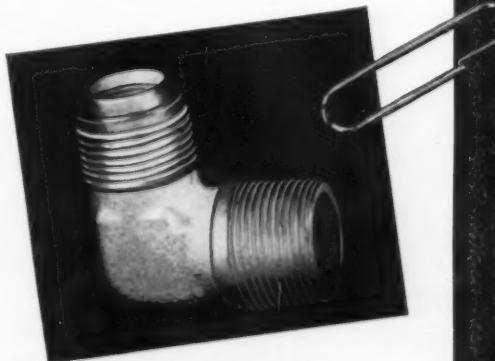
characteristics:

Inland regularly produces *Ledloy* free-machining open hearth steels to a wide variety of chemical specifications to meet customer requirements. In each instance, regardless of chemical composition, the addition of lead by the Inland process results in no significant change in the desirable mechanical and metallurgical characteristics of the steel. All the important qualities of open hearth steels such as ductility, impact values, transverse strength, case hardening qualities and cross sectional soundness, are fully retained. *The only thing changed is the machining characteristic which is vastly improved.*

availability:

Inland *Ledloy* free-machining steels are available in a wide range of standard carbon and alloy grades in bar form or plates. In forgings, the increase in machinability is every bit as good as that obtained in bar stock steel and finish is superior.

If your product requires machining, it will pay you to investigate the potential savings offered by Inland *Ledloy*—the original leaded steels. Ask your Cold Drawer or Steel Service Center about Inland leaded steels, today. They are offered as *Ledloy* or under other brand names. For the very informative booklet, "Properties of Inland *Ledloy* Steels," write to Inland Steel Company, 30 West Monroe Street, Chicago 3, Illinois.



A switch to *Ledloy* Grade A in these forged fittings permitted a 27% increase in machinability.

INLAND STEEL  **LEDLOY STEELS**

the world's most machinable

*Reg. Trade Mark

SCRAP PRICES (Effective Jan. 27, 1959)

Pittsburgh

No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	45.00 to 46.00
No. 1 factory bundles	49.00 to 50.00
No. 2 bundles	32.00 to 33.00
No. 1 busheling	45.00 to 46.00
Machine shop turn.	23.00 to 24.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. punch'gs plate	49.00 to 50.00
Heavy turnings	37.00 to 38.00
No. 1 RR hvy. melting	48.00 to 49.00
Scrap rails, random lgth.	54.00 to 55.00
Rails 2 ft and under	57.00 to 58.00
RR specialties	50.00 to 51.00
No. 1 machinery cast.	51.00 to 52.00
Cupola cast	45.00 to 46.00
Heavy breakable cast	43.00 to 44.00
Stainless	
18-8 bundles and solids	225.00 to 230.00
18-8 turnings	120.00 to 125.00
430 bundles and solids	125.00 to 130.00
410 turnings	50.00 to 60.00

Chicago

No. 1 hvy. melting	\$42.00 to \$43.00
No. 2 hvy. melting	36.00 to 38.00
No. 1 dealer bundles	43.00 to 44.00
No. 1 factory bundles	46.00 to 47.00
No. 2 bundles	30.00 to 32.00
No. 1 busheling	42.00 to 43.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	24.00 to 25.00
Cast iron borings	23.00 to 24.00
Low phos. forge crops	56.00 to 57.00
Low phos. punch'gs plate	
1/4 in. and heavier	52.00 to 53.00
Low phos. 2 ft and under	50.00 to 51.00
No. 1 RR hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	52.00 to 53.00
Re-rolling rails	63.00 to 64.00
Rails 2 ft and under	59.00 to 60.00
Angles and splice bars	54.00 to 55.00
RR steel car axles	71.00 to 72.00
RR couplers and knuckles	51.00 to 52.00
No. 1 machinery cast.	56.00 to 57.00
Cupola cast	48.00 to 50.00
Cast iron wheels	44.00 to 45.00
Malleable	58.00 to 59.00
Stove plate	46.00 to 47.00
Steel car wheels	53.00 to 54.00
Stainless	
18-8 bundles and solids	220.00 to 225.00
18-8 turnings	120.00 to 125.00
430 bundles and solids	120.00 to 125.00
430 turnings	60.00 to 65.00

Philadelphia Area

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	39.00 to 40.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	39.00 to 40.00
Machine shop turn.	21.00 to 22.00
Mixed bor. short turn.	22.00 to 23.00
Cast iron borings	22.00 to 23.00
Shoveling turnings	24.00 to 25.00
Clean cast. chem. borings	30.00 to 31.00
Low phos. 5 ft and under	42.00 to 43.00
Low phos. 2 ft punch'gs	43.00 to 44.00
Elec. furnace bundles	40.00 to 41.00
Heavy turnings	34.00 to 35.00
RR specialties	43.00 to 44.00
Rails 18 in. and under	57.00 to 58.00
Cupola cast	38.00 to 39.00
Heavy breakable cast	41.00 to 42.00
Cast iron car wheels	44.00 to 45.00
Malleable	62.00 to 64.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	26.00 to 27.00
Machine shop turn.	19.00 to 20.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	19.00 to 20.00
Low phos. 18 in. and under	47.00 to 48.00
Rails, random length	49.00 to 50.00
Rails, 18 in. and under	55.00 to 56.00
No. 1 cupola cast	45.00 to 46.00
Hvy. breakable cast	39.00 to 40.00
Drop broken cast	47.00 to 48.00

Youngstown

No. 1 hvy. melting	\$45.00 to \$46.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 dealer bundles	45.00 to 46.00
No. 2 bundles	30.00 to 31.00
Machine shop turn.	19.50 to 20.50
Shoveling turnings	19.50 to 20.50
Low phos. plate	47.00 to 48.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Cleveland

No. 1 hvy. melting	\$41.50 to \$42.50
No. 2 hvy. melting	33.50 to 34.50
No. 1 dealer bundles	41.50 to 42.50
No. 1 factory bundles	47.00 to 48.00
No. 2 bundles	27.50 to 28.50
No. 1 busheling	41.50 to 42.50
Machine shop turn.	15.50 to 16.50
Mixed bor. and turn.	20.50 to 21.50
Shoveling turnings	20.50 to 21.50
Cast iron borings	20.50 to 21.50
Cut structural & plates, 2 ft & under	48.00 to 49.00
Drop forge flashings	41.50 to 42.50
Low phos. punch'gs plate	42.50 to 43.50
Foundry steel, 2 ft & under	40.00 to 41.00
No. 1 RR hvy. melting	47.00 to 48.00
Rails 2 ft and under	56.00 to 57.00
Rails 18 in. and under	57.00 to 58.00
Steel axle turnings	26.00 to 27.00
Railroad cast.	52.00 to 53.00
No. 1 machinery cast.	50.00 to 51.00
Stove plate	47.00 to 48.00
Malleable	61.00 to 62.00
Stainless	
18-8 bundles	215.00 to 220.00
18-8 turnings	115.00 to 120.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	9.00 to 10.00
Shoveling turnings	11.00 to 12.00
Clean cast. chem. borings	18.00 to 19.00
No. 1 machinery cast	33.00 to 34.00
Mixed cupola cast	32.00 to 33.00
Heavy breakable cast	30.00 to 31.00
Stove plate	29.00 to 30.00

St. Louis

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	15.00 to 16.00
Low phos. plate	40.00 to 41.00
Structural and plate, 2 ft & under	44.00 to 45.00
Scrap rails, random lengths	46.00 to 47.00
Rails 2 ft and under	56.00 to 57.00
No. 1 machinery cast	48.00 to 49.00
No. 1 cupola cast	44.00 to 45.00

Birmingham

No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	33.00 to 34.00
Machine shop turn.	21.00 to 22.00
Shoveling turnings	22.00 to 23.00
Cast iron borings	22.00 to 23.00
No. 1 RR hvy. melting	44.00 to 45.00
Rails, random lengths	47.00 to 48.00
Rails, 18 in. and under	52.00 to 53.00
Angles and splice bars	48.00 to 49.00
RR specialties	46.00 to 47.00
Cupola cast	47.00 to 48.00
Heavy breakable cast	38.00 to 39.00
Cast iron brake shoes	37.00 to 38.00
Stove plate	44.00 to 45.00
Cast iron car wheels	44.00 to 45.00
Rerolling rails	59.00 to 60.00
Unstripped motor blocks	39.00 to 40.00

New York

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$28.00 to \$29.00
No. 2 hvy. melting	25.00 to 26.00
No. 2 dealer bundles	19.00 to 20.00
Machinist shop turnings	11.00 to 12.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	15.00 to 16.00
Clean chem. cast. borings	23.00 to 25.00
No. 1 machinery cast	27.00 to 28.00
Mixed yard cast.	33.00 to 34.00
Heavy breakable cast	32.00 to 33.00
Stainless	
18-8 prepared solids	185.00 to 190.00
18-8 turnings	80.00 to 85.00
430 prepared solids	65.00 to 70.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$36.00 to \$37.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	38.00 to 39.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	36.00 to 37.00
Drop forge flashings	35.00 to 36.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	15.00 to 16.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	16.00 to 17.00
Heavy breakable cast	34.00 to 35.00
Mixed cupola cast	42.00 to 43.00
Automotive cast	47.00 to 48.00
Stainless	
18-8 bundles and solids	210.00 to 215.00
18-8 turnings	100.00 to 105.00
430 bundles and solids	105.00 to 110.00

Boston

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$28.00 to \$29.00
No. 2 hvy. melting	22.00 to 23.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	16.00 to 17.00
No. 1 busheling	28.00 to 29.00
Machine shop turn.	9.00 to 10.00
Shoveling turnings	11.00 to 12.00
Clean cast. chem. borings	18.00 to 19.00
No. 1 machinery cast	33.00 to 34.00
Mixed cupola cast	32.00 to 33.00
Heavy breakable cast	30.00 to 31.00
Stove plate	29.00 to 30.00

San Francisco

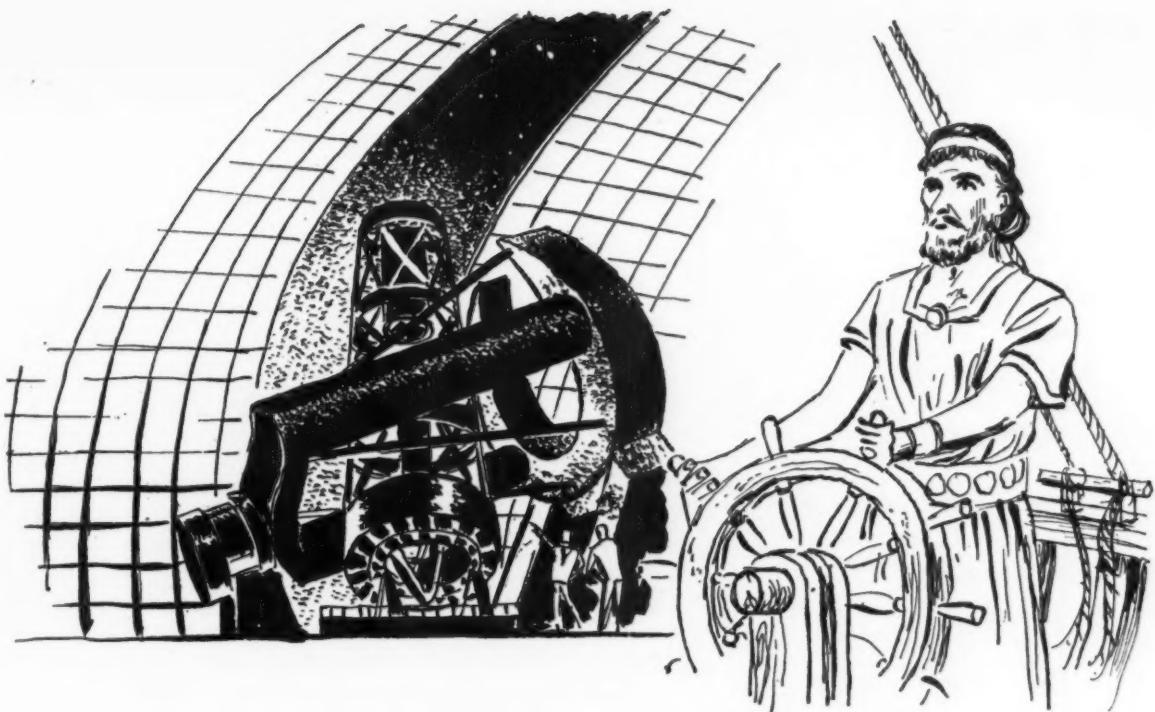
No. 1 hvy. melting	\$32.00 to \$34.00
No. 2 hvy. melting	30.00 to 32.00
No. 1 dealer bundles	28.00 to 30.00
No. 2 bundles	22.00
No. 1 cupola cast	16.00
Machine shop turn.	15.00
Cast iron borings	15.00
No. 1 cupola cast	15.00
Elec. furn. 1 ft and under (foundry)	47.00
No. 1 cupola cast	41.00

Seattle

No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	28.00
No. 2 bundles	22.00
No. 1 cupola cast	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

Brokers buying prices per gross ton on cars:	
No. 1 hvy. melting	\$34.50
No. 2 hvy. melting	30.50
No. 1 dealer bundles	34.50
No. 2 bundles	25.00
Mixed steel scrap	26.50
Bush., new fact., prep'd.	34.50
Bush., new fact., unprep'd.	28.50
Machine shop turn.	13.00
Short steel turn.	17.00
Mixed bor. and turn.	13.00
Rails, rerolling	



Seeing Stars

For centuries man has studied the heavens, watching the stars to give direction to his caravels and caravans. The study of astronomy, started in biblical times, was developed by the Greeks into a coherent science. In 1609 Galileo devised his telescope and used it for a new understanding of our solar system.

Today's great 200-inch reflector on Mt. Palomar, as well as innumerable types and sizes of telescopes, microscopes, field glasses and other optical instruments using lens systems, depend upon steel for their construction and operation.

Thus, in science—as in industry, transportation, agriculture, defense, and almost every avenue of man's activities—steel is the indispensable ingredient.

To insure its constant supply in millions of tons, a never-failing stock of scrap must be continuously maintained.

For the purchase or sale of iron or steel scrap...

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Telephone ANDover 3-3900

When Will Copper Price Rise?

It depends on the level of fabricator business.

U. S. producers' price won't move as long as the domestic supply isn't strained.

■ The whisper has grown to a rumble. Almost everyone in the copper trade is now wondering, out loud, when U. S. copper producers will raise their prices.

Observers generally considered most astute say, despite the complex series of factors working on the current U. S. price, the key really is simple.

U. S. producers' price for copper will rise when domestic business reaches the point that larger tonnages of foreign metal are needed to avoid a spot shortage. And custom smelters are likely to precede the producers up.

Also, observers say producers will raise their prices by at least 2¢ per lb. The situation could develop almost anytime, they add, certainly by spring at the latest.

Here's the picture.

Behind the Talk — The first inkling of a possible hike in U. S. producers' price came to a few near the end of 1958 when they saw a chance that improved business might be sustained into 1959. It has been, to some extent. Unsold stocks at smelters have dwindled about as low as they are likely to get. And, while fabricators finished 1958 with a 22-month high for unfilled orders, a spot check of wire and brass mills indicates January is probably better.

However, there are still some soft spots. Shipments of copper to fabricators in the U. S. were slightly off in December. Most of this was due to inventory bookkeeping maneuvering. January is better, but how much is hazy. So is the condition of ingot maker business.

And in the face of these soft spots, shipments to fabricators outside the U. S. picked up at the end of 1958. The 1958 total hit a 5-year high, while in the U. S., shipments of copper to fabricators in 1958 hit a 5-year low.

At Least 2¢ Worth — Why will the U. S. producer price jump at least 2¢? Initially, because with European demand firm, any smaller jump would be immediately met by European buyers, and would be completely ineffective.

Secondly, the U. S. price must be at least 2¢ higher than in Europe to lure more copper here. An importer into the U. S. must pay 1.7¢ per lb tariff. Also, if the copper comes from Chile, freight rates from there to here were raised recently by \$1 per ton, while rates from Chile to Europe weren't.

The deadline is usually pegged in spring because with labor contracts at most major U. S. installations expiring June 30, a healthy round of hedge buying in the second quarter is almost a sure thing.

Zinc and Lead

If you were in a country without a specific quota to bring lead or zinc, metal or ore into the U. S. you would be in tough shape.

About your only chance would be to put the metal or ore in bond in the U. S. and get to the customs office very early on the first morning of a new import period.

Officially, the quotas for "all other countries" to import lead, zinc, and zinc ore into the U. S. during the first quarter 1959 were filled by Jan. 14. But observers at the Custom Bureau said the quota was actually accounted for in the first few days.

You can still bring in lead ore. But the lead market is about the weakest of all the nonferrous metals at this time. A surprise cut in the price of lead, down 1¢ per lb to 12¢, actually had little effect on the market. Sales were pretty much as at the higher levels—light.

Report on lead and zinc imports to Jan. 22 indicates several first quarter quotas for specific countries have been filled, and several are almost full.

The Administration is committed to quotas this year. But it is starting to look like pressure building up in industry, and recommendations from inside government will prompt some changes.

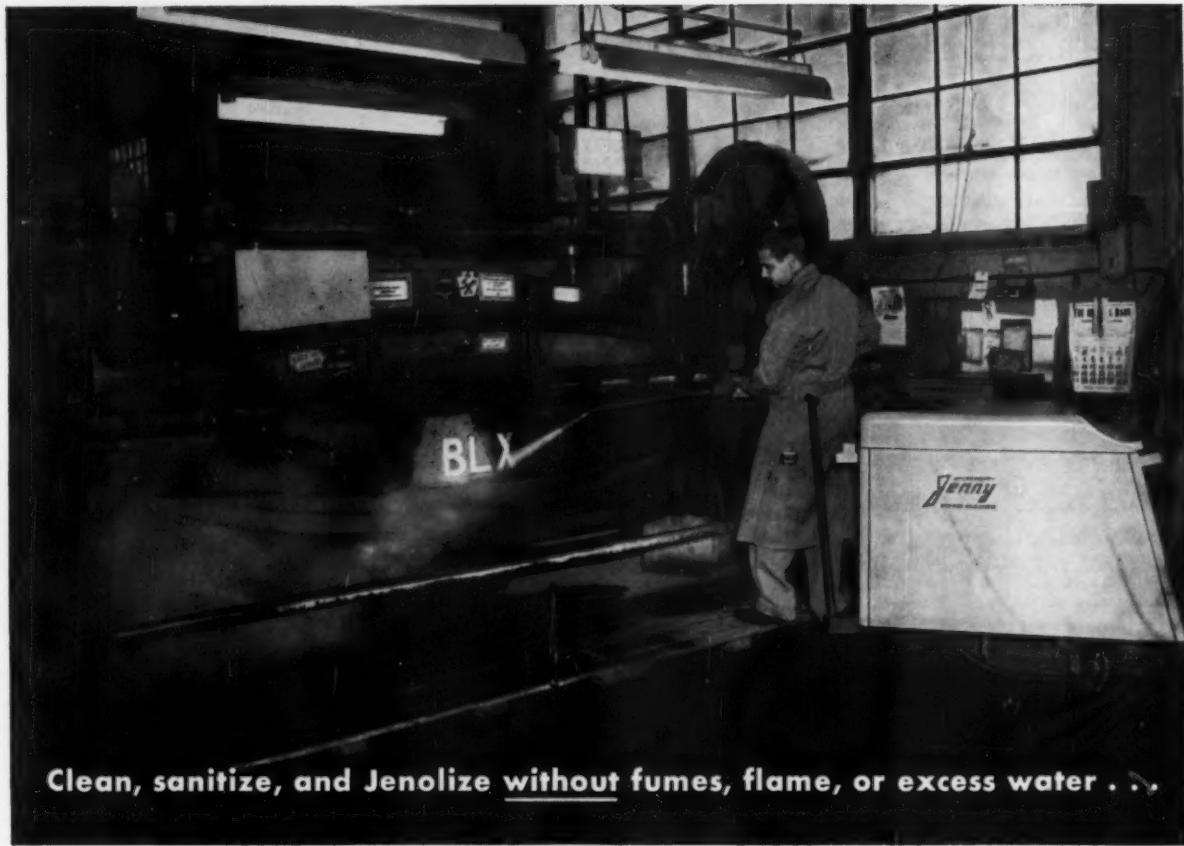
Tin prices for the week: Jan. 21—99.875; Jan. 22—99.75; Jan. 23—99.75; Jan. 26—99.875; Jan. 27—99.875.*

* Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/58
Aluminum Ingot	28.80	28.10	8/1/58
Copper (E)	29.00	27.50	10/23/58
Copper (CS)	29.50	29.00	1/12/59
Copper (L)	29.00	27.50	10/23/58
Lead, St. L.	11.80	12.00	1/21/58
Lead, N. Y.	12.00	13.00	1/21/58
Magnesium Ingot	38.00	34.00	8/13/58
Magnesium pig	38.25	33.75	8/13/58
Nickel	74.00	64.50	12/8/58
Titanium sponge	182-182	185-205	11/3/58
Zinc, E. St. L.	11.80	11.00	11/7/58
Zinc, N. Y.	12.00	11.50	11/7/58

ALUMINUM: 99% Ingot frt allwd. **COPPER:** (E) — electrolytic, (CS) — custom smelters, electrolytic. (L) — lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **Tin:** See above; Other primary prices, pg. 109.



Clean, sanitize, and Jenolize without fumes, flame, or excess water . . .

New All-Electric Hyppressure Jenny!

Anywhere that flame, fumes, or excess water are objectionable or hazardous, the new Model E-350 All-Electric Jenny® will solve the cleaning or sanitizing problem. And with the new Jenolizing Process, machinery, equipment, and parts are left with a coating that protects against flash rusting, and gives a glossy, like-new appearance to painted surfaces.

Model E-350 combines the right amounts of heat, pressure, and cleaning solution to handle the majority of cleaning jobs at savings of up to 80% in time and labor costs. Its compact size, portability, low water output, and quiet operation without flame, smoke, or fuel fumes, make it ideal for use practically anywhere in the plant.

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Hyppressure Jenny Division, P. O. Box 23, Coraopolis, Pa.

NONFERROUS PRICES

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 20,000 lb, f.o.b. ship pt., frt. allowed)

Flat Sheet (Mill Finish and Plate) (“F” temper except 6061-0)

Alloy	.082	.081	.136	.249	.250
1100, 3003.....	45.7	43.8	42.8	43.8	
5052.....	53.1	48.4	46.9	46.0	
6061-0.....	50.1	45.7	43.9	44.9	

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8.....	42.7-44.2	51.1-54.8
12-14.....	42.7-44.2	52.0-56.5
24-26.....	43.2-44.7	62.8-67.5
36-38.....	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size*	3/4	5/16	5/8	1 1/4-1 3/4
Price.....	62.0	61.2	60.7	67.8

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"	72	96	120	144
.019 gage.....	\$1,411	\$1,884	\$2,353	\$2,823
.024 gage.....	1,762	2,349	2,937	3,524

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type→	Gage	250	250	.188	.081	.082
AZ31B Stand, Grade.....		67.9	60.0	77.9	108.1	
AZ31B Spec.....		98.3	95.7	108.7	171.8	
Tread Plate.....		70.6	71.7			
Tooling Plate.....	78.0					

Extruded Shapes

factor→	8-8	12-14	24-36	36-38
Comm. Grade. (AZ31C).....	69.9	70.7	75.6	80.3
Spec. Grade. (AZ31B).....	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting)..... 37.25 (delivered)

AZ63A, AZ62A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	“A” Nickel Monel	Inconel
Sheet, CR	126	106
Strip, CR	124	108
Rod, bar, HR	107	89
Angles, HR	107	89
Plates, HR	120	105
Seamless tube	157	129
Shot, blocks	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper.....	53.13		50.36	53.32
Brass, Yellow.....	46.57	47.11	46.51	49.98
Brass, Low.....	49.23	49.77	49.17	52.54
Brass, R L.....	50.17	50.71	50.11	53.48
Brass, Naval.....	51.24		45.05	54.65
Muntz Metal.....	49.35		44.66	
Comm. Bs.....	51.05	52.10	51.59	54.71
Mang. Bs.....	54.94		48.64	
Phos. Bs. 5%.....	72.32		73.00	

TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, \$6.90-
\$7.40; alloy, \$14.35; Plate, HR, commercially
pure, \$6.00-\$5.75; alloy, \$7.75-\$8.50. Wire,
rolled and drawn, commercially pure, \$5.50-
\$6.00; alloy, \$8.00-\$9.50; Bar, HR or forged,
commercially pure, \$4.25-\$4.65; alloy, \$4.25-
\$7.15; billets, HR, commercially pure, \$3.55-
\$4.10; alloy, \$3.55-\$5.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex. 29.50
Beryllium aluminum 5% Be, Dollar
per lb contained Be..... \$74.75
Beryllium copper, per lb conta'd Be \$43.00
Beryllium 97% lump or beads,
f.o.b. Cleveland, Reading..... \$71.50
Bismuth, ton lots..... \$2.25
Cadmium, del'd..... \$1.45
Calcium, 99.9% small lots..... \$4.55
Chromium, 99.8% metallic basis..... \$1.31
Cobalt, 97-99% (per lb)..... \$2.00 to \$2.07
Germanium, per gm, f.o.b. Miami,
Okla., refined..... \$35.00 to \$42.00
Gold, U. S. Treas., per troy oz..... \$35.00
Indium, 99.9%, dollars per troy oz..... \$2.25
Iridium, dollars per troy oz..... \$70 to \$80
Lithium, 98%..... \$11.00 to \$14.00
Magnesium, sticks, 100 to 500 lb..... \$9.00
Mercury, dollars per 76-lb flask,
f.o.b. New York..... \$218 to \$221
Nickel oxide sinter at Buffalo, N. Y.,
or other U. S. points of entry,
contained nickel..... 69.60
Palladium, dollars per troy oz..... \$15 to \$17
Platinum, dollars per troy oz..... \$50 to \$55
Rhodium..... \$120.00 to \$125.00
Silver ingots (per troy oz)..... \$90.375
Thorium, per kg..... \$43.00
Vanadium..... \$3.45
Zirconium sponge..... \$5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot	
No. 115.....	28.00
No. 120.....	27.00
No. 123.....	26.00
80-10-10 ingot	
No. 305.....	32.25
No. 315.....	30.25
88-10-2 ingot	
No. 210.....	39.75
No. 215.....	35.50
No. 245.....	32.25
Yellow ingot	
No. 405.....	23.00
Manganese bronze	
No. 421.....	24.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys	
0.30 copper max.....	24.75-25.00
0.60 copper max.....	34.50-24.75
Piston alloys (No. 122 type).....	24.25-25.25
No. 12 alum. (No. 2 grade).....	21.50-22.00
108 alloy.....	22.00-22.50
195 alloy.....	25.00-26.00
13 alloy (0.60 copper max).....	24.25-24.75
AXS-679 (1 pct zinc).....	21.75-22.25

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1-95-97 1/2%	22.50-23.50
Grade 2-92-95%	21.25-22.25
Grade 3-90-92%	20.25-21.25
Grade 4-85-90%	17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for
shipments of 20,000 lb and over)

Heavy	Turnings
Copper.....	25
Yellow brass.....	19
Red brass.....	22
Comm. bronze.....	22
Mang. bronze.....	17
Free cutting rod ends.....	18

Customs Smelters Scrap

(Cents per pound carload lots, delivered
to refinery)

No. 1 copper wire.....	25%
No. 2 copper wire.....	24 1/4
Light copper.....	22
No. 1 composition.....	20
No. 1 comp. turnings.....	19 1/2
Hvy. yellow brass solids.....	14 1/2
Brass pipe.....	16
Radiators.....	16 1/4

Ingot Makers Scrap

(Cents per pound carload lots, delivered
to refinery)

No. 1 copper wire.....	25
No. 2 copper wire.....	24 1/4
Light copper.....	22
No. 1 composition.....	20
No. 1 comp. turnings.....	19 1/2
Cocks and faucets.....	14
Clean heavy yellow brass.....	12 1/2
Brass pipe.....	14
New soft brass clippings.....	14 1/2
No. 1 brass rod turnings.....	12

Dealers' Scrap

(Dealers' buying price f.o.b. New York
in cents per pound)

Copper and Brass	
No. 1 copper wire.....	23
No. 2 copper wire.....	21
Light copper.....	19
Auto radiators (unsweated).....	13 1/2
No. 1 composition.....	17
No. 1 composition turnings.....	16
Cocks and faucets.....	14
Clean heavy yellow brass.....	12 1/2
Brass pipe.....	14
New soft brass clippings.....	15
No. 1 brass rod turnings.....	12

Nickel and Monel

Pure nickel clippings.....	52-54
Clean nickel turnings.....	37-40
Nickel anodes.....	52-54
Nickel rod ends.....	52-54
New Monel clippings.....	30-32
Clean Monel turnings.....	30-32
Old sheet Monel.....	26-28
Nickel silver clippings, mixed.....	18
Nickel silver turnings, mixed.....	15

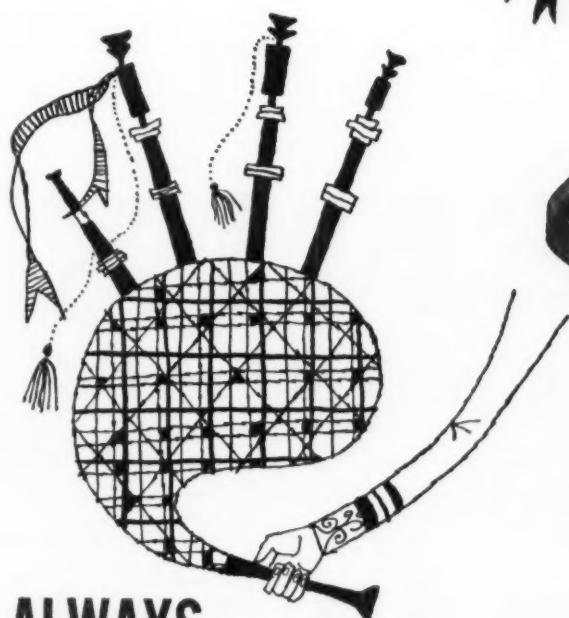
Lead

Soft scrap lead.....	8
Battery plates (dry).....	2 1/2
Batteries, acid free.....	2 1/2

Miscellaneous

Block tin.....	75
No. 1 pewter.....	59
Auto babbitt.....	39
Mixer common babbitt.....	9 1/2
Solder joints.....	13 1/2
Siphon tops.....	42
Small foundry type.....	10 1/2
Monotype.....	10 1/2
Lino. and stereotype.....	9 1/2
Electrotype.....	8 1/2
Hand picked type shells.....	7
Lino. and stereo. dross.....	6 1/2
Electro dross.....	2 1/2

(Effective Jan. 26, 1959)



ALWAYS FULL COUNT, FULL QUALITY IN ALCOA ALUMINUM FASTENERS!

YOU'LL FIND 144 or more *perfect* fasteners in *every* gross box when you order from your local Alcoa Distributor. On bulk items, too, you'll receive the number of pieces ordered. And there'll be no rejects, no misfits, no "seconds" . . . whether you buy a hatful or a carload!

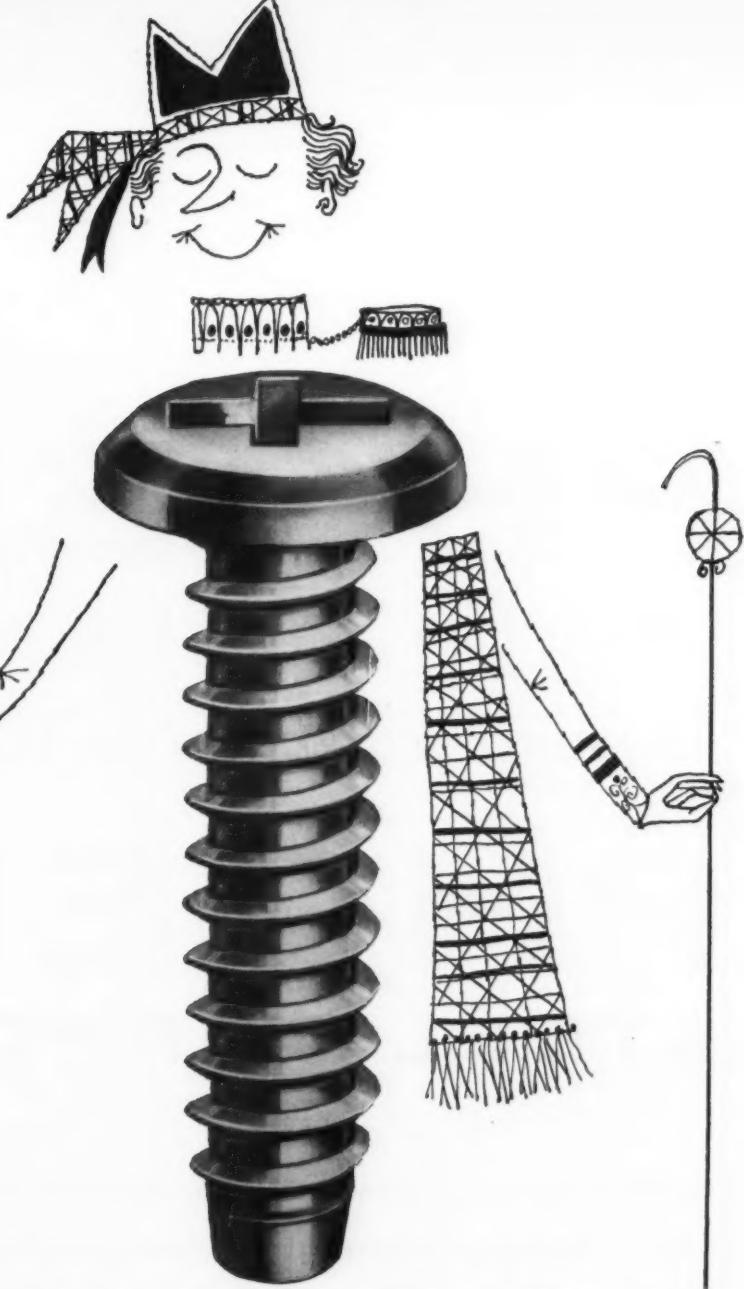
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Your Alcoa Distributor carries *complete* stocks of all standard types and sizes, locally—for really prompt filling of your orders. You'll find him in the Yellow Pages of your phone book. Why not give him a call right now? Or, if you'd like additional facts and a few samples, just mail the coupon!

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Gentlemen: Please send complete specification data and samples of Alcoa Aluminum Fasteners.

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PHOENIX

IRON & STEEL COMPANY

has changed its name to

PHOENIX

STEEL CORPORATION

To fully reflect the nature of the company today, Phoenix Iron & Steel Company, a subsidiary of Barium Steel Corporation, has changed its name to Phoenix Steel Corporation.

The change in name was suggested by the program of modernization upon which this 176-year-old company is presently embarked. With new equipment, new products and new plants, and with a new steel making facility currently being planned, the new name more accurately depicts this modern steel producer, Phoenix Steel Corporation.

9.1

IRON AGE STEEL PRICES		<i> Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.</i>													
		BILLETS, BLOOMS, SLABS			PIL- ING		SHAPES STRUCTURALS			STRIP					
Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide- Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot- rolled	Alloy Cold- rolled			
EAST	Bethlehem, Pa.		\$119.00 <i>B3</i>		5.55 <i>B3</i>	8.10 <i>B3</i>	5.55 <i>B5</i>								
	Buffalo, N. Y.	\$80.00 <i>R3</i> , <i>B3</i>	399.50 <i>R3</i> , <i>B3</i>	\$119.00 <i>R3</i> , <i>B3</i>	6.50 <i>B3</i>	5.55 <i>B3</i>	8.10 <i>B3</i>	5.55 <i>B3</i>	5.10 <i>B3</i> , <i>R3</i>	7.425 <i>S10</i> , <i>R7</i>	7.575 <i>B3</i>				
	Phila., Pa.									7.875 <i>P15</i>					
	Harrison, N. J.													15.55 <i>C11</i>	
	Conshohocken, Pa.		\$104.50 <i>A2</i>	\$126.00 <i>A2</i>					5.15 <i>A2</i>		7.575 <i>A2</i>				
	New Bedford, Mass.									7.875 <i>R6</i>					
	Johnstown, Pa.	\$80.00 <i>B3</i>	399.50 <i>B3</i>	\$119.00 <i>B3</i>		5.55 <i>B3</i>	8.10 <i>B3</i>								
	Boston, Mass.									7.975 <i>T8</i>					
	New Haven, Conn.									7.875 <i>D1</i>					
	Baltimore, Md.									7.425 <i>T8</i>				15.90 <i>T8</i>	
	Phoenixville, Pa.				5.55 <i>P2</i>		5.55 <i>P2</i>								
	Sparrows Pt., Md.								5.10 <i>B3</i>		7.575 <i>B3</i>				
	New Britain, Bridgeport, Wallingford, Conn.		\$119.00 <i>N8</i>						7.875 <i>W1,S7</i>						
	Pawtucket, R. I., Worcester, Mass.									7.975 <i>N7</i> , <i>A5</i>				15.90 <i>N7</i> , 15.70 <i>T8</i>	
MIDDLE WEST	Alton, Ill.							5.30 <i>L1</i>							
	Ashland, Ky.							5.10 <i>A7</i>		7.575 <i>A7</i>					
	Canton-Massillon, Dever, Ohio		\$102.00 <i>R3</i>	\$119.00 <i>R3</i> , \$114.00 <i>T5</i>					7.425 <i>G4</i>		10.80 <i>G4</i>				
	Chicago, Ill., Franklin Park, Ill., Evanston, Ill.	\$80.00 <i>U1</i> , <i>R3</i>	399.50 <i>U1</i> , <i>R3,W8</i>	\$119.00 <i>U1</i> , <i>R3,W8</i>	6.50 <i>U1</i>	5.50 <i>U1</i> , <i>W8,P13</i>	8.05 <i>U1</i> , <i>Y1,W8</i>	5.50 <i>U1</i>	5.10 <i>W8</i> , <i>N4,A1</i>	7.525 <i>A1,T8</i> , <i>M8</i>	7.575 <i>W8</i>		8.40 <i>W8</i> , <i>S9,I3</i>	15.55 <i>A1</i> , <i>S9,G4,T8</i>	
	Cleveland, Ohio									7.425 <i>A5,J3</i>		10.75 <i>A5</i>	8.40 <i>J3</i>		
	Detroit, Mich.			\$119.00 <i>R5</i>					5.10 <i>G3</i> , <i>M2</i>	7.425 <i>M2,S1</i> , <i>D1,P11</i>	7.575 <i>G3</i>	10.80 <i>S1</i>			
	Anderson, Ind.									7.425 <i>G4</i>					
	Gary, Ind. Harbor, Indiana	\$80.00 <i>U1</i>	399.50 <i>U1</i>	\$119.00 <i>U1</i> , <i>Y1</i>		5.50 <i>U1</i> , <i>I3</i>	8.05 <i>U1</i> , <i>J3</i>	5.50 <i>I3</i>	5.10 <i>U1</i> , <i>I3,Y1</i>	7.425 <i>Y1</i>	7.575 <i>U1</i> , <i>I3,Y1</i>	10.90 <i>Y1</i>	8.40 <i>U1</i> , <i>Y1</i>		
	Sterling, Ill.	\$80.00 <i>N4</i>				5.50 <i>N4</i>			5.20 <i>N4</i>						
	Indianapolis, Ind.									7.575 <i>R5</i>				15.70 <i>R5</i>	
	Newport, Ky.								5.10 <i>A9</i>				8.40 <i>A9</i>		
	Niles, Warren, Ohio Sharen, Pa.		399.50 <i>SI</i> , <i>C10</i>	\$119.00 <i>SI</i> , <i>C10,SI</i>					5.10 <i>R3</i> , <i>SI</i>	7.425 <i>R3</i> , <i>T4,SI</i>	7.575 <i>R3</i> , <i>SI</i>	10.80 <i>R3</i> , <i>SI</i>	8.40 <i>SI</i>	15.55 <i>SI</i>	
	Owensboro, Ky.	\$80.00 <i>G5</i>	399.50 <i>G5</i>	\$119.00 <i>G5</i>											
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	\$80.00 <i>U1</i> , <i>P6</i>	399.50 <i>U1</i> , <i>C11,P6</i>	\$119.00 <i>U1</i> , <i>C11,B7</i>	6.50 <i>U1</i>	5.50 <i>U1</i> , <i>J3</i>	8.05 <i>U1</i> , <i>J3</i>	5.50 <i>U1</i>	5.10 <i>P6</i>	7.425 <i>J3,B4</i> , <i>7.525 E3</i>			8.40 <i>S9</i>	15.55 <i>S9</i>	
	Weirton, Wheeling, Fellansbee, W. Va.				6.50 <i>U1</i> , <i>W3</i>	5.50 <i>W3</i>		5.50 <i>W3</i>	5.10 <i>W3</i>	7.425 <i>F3</i>	7.575 <i>W3</i>	10.80 <i>W3</i>			
	Youngstown, Ohio	\$80.00 <i>R3</i>	399.50 <i>Y1</i> , <i>C10</i>	\$119.00 <i>Y1</i>			8.05 <i>Y1</i>		5.10 <i>U</i>	7.425 <i>Y1,RS</i>	7.575 <i>U1</i> , <i>Y1</i>	10.95 <i>Y1</i>	8.40 <i>U1</i> , <i>Y1</i>	15.55 <i>RS</i> , <i>Y1</i>	
WEST	Fontana, Cal.	\$90.50 <i>K1</i>	\$109.00 <i>K1</i>	\$140.00 <i>K1</i>		6.30 <i>K1</i>	8.85 <i>K1</i>	6.45 <i>K1</i>	5.825 <i>K1</i>	9.20 <i>K1</i>					
	Geneva, Utah						5.50 <i>C7</i>	8.05 <i>C7</i>							
	Kansas City, Mo.						5.60 <i>S2</i>	8.15 <i>S2</i>						8.65 <i>S2</i>	
	Los Angeles, Torrance, Cal.			\$109.00 <i>B2</i>	\$139.00 <i>B2</i>	6.20 <i>C7</i> , <i>B2</i>	8.75 <i>B2</i>	5.85 <i>C7</i> , <i>B2</i>	9.30 <i>C7,RS</i>					9.60 <i>B2</i>	17.75 <i>J3</i>
	Minneapolis, Colo.						5.80 <i>C6</i>		6.20 <i>C6</i>	9.375 <i>C6</i>					
	Portland, Ore.						6.25 <i>O2</i>								
	San Francisco, Niles, Pittsburg, Cal.					6.15 <i>B2</i>	8.70 <i>B2</i>	5.85 <i>C7</i> , <i>B2</i>							
	Seattle, Wash.					6.25 <i>B2</i>	8.80 <i>B2</i>	6.10 <i>B2</i>							
SOUTH	Atlanta, Ga.					5.70 <i>A8</i>		5.10 <i>A8</i>							
	Fairfield, Ala. City, Birmingham, Ala.	\$80.00 <i>T2</i>	399.50 <i>T2</i>			5.50 <i>T2</i> , <i>R3,C16</i>	8.85 <i>T2</i>	5.10 <i>T2</i> , <i>R3,C16</i>		7.575 <i>T2</i>					
	Houston, Lone Star, Texas					5.80 <i>S2</i>	8.15 <i>S2</i>							8.65 <i>S2</i>	

(Effective Jan. 26, 1959)

IRON AGE		Sheets								WIRE ROD	TINPLATE†			
<i>Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise-noted. Extras apply.</i>														
STEEL PRICES		Hot-rolled <i>18 ga. & hvy.</i>	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1.25-lb. base box	Electro** 0.25-lb. base box	Holloware Enameling 29 ga.	
EAST	Buffalo, N. Y.	5.10 <i>B3</i>	6.275 <i>B3</i>				7.525 <i>B3</i>	9.275 <i>B3</i>		6.40 <i>W6</i>				
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	5.15 <i>A2</i>	6.325 <i>A2</i>				7.575 <i>A2</i>							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.													
	Fairless, Pa.	5.15 <i>U1</i>	6.325 <i>U1</i>				7.575 <i>U1</i>	9.325 <i>U1</i>						
	New Haven, Conn.													
	Phoenixville, Pa.													
MIDDLE WEST	Sparrows Pt., Md.	5.10 <i>B3</i>	6.275 <i>B3</i>	6.875 <i>B3</i>			7.525 <i>B3</i>	9.275 <i>B3</i>	10.025 <i>B3</i>	6.50 <i>B3</i>	10.40 <i>B3</i>	9.10 <i>B3</i>		
	Worcester, Mass.													
	Trenton, N. J.													
	Alton, Ill.										6.60 <i>L1</i>			
	Ashland, Ky.	5.10 <i>A7</i>		6.875 <i>A7</i>	6.775 <i>A7</i>		7.525 <i>A7</i>							
	Canton-Massillon, Dover, Ohio			6.875 <i>R1, R3</i>										
	Chicago, Joliet, Ill.	5.10 <i>W8, A1</i>					7.525 <i>U1, W8</i>			6.40 <i>A5, R3, W8</i>				
	Sterling, Ill.										6.50 <i>N4, K2</i>			
	Cleveland, Ohio	5.10 <i>R3, J3</i>	6.275 <i>R3, J3</i>	7.65 <i>R3*</i>	6.775 <i>R3</i>		7.525 <i>R3, J3</i>	9.275 <i>R3, J3</i>		6.40 <i>A5</i>				
	Detroit, Mich.	5.10 <i>G3, M2</i>	6.275 <i>G3, M2</i>				7.525 <i>G3</i>	9.275 <i>G3</i>						
WEST	Newport, Ky.	5.10 <i>A1</i>	6.275 <i>A1</i>											
	Gary, Ind. Harbor, Indiana	5.10 <i>U1, J3, Y1</i>	6.275 <i>U1, J3, Y1</i>	6.775 <i>U1, J3, Y1</i>	7.225 <i>U1</i>		7.525 <i>U1, Y1, J3</i>	9.275 <i>U1, Y1</i>		6.40 <i>Y1</i>	10.40 <i>U1, Y1</i>	9.10 <i>J3, U1, Y1</i>	7.85 <i>U1, Y1</i>	
	Granite City, Ill.	5.20 <i>G2</i>	6.375 <i>G2</i>	6.875 <i>G2</i>								9.20 <i>G2</i>	7.95 <i>G2</i>	
	Kokomo, Ind.			6.875 <i>C9</i>							6.50 <i>C9</i>			
	Manfield, Ohio	5.10 <i>E2</i>	6.275 <i>E2</i>				7.225 <i>E2</i>							
	Middletown, Ohio		6.275 <i>A7</i>	6.875 <i>A7</i>	6.775 <i>A7</i>	7.225 <i>A7</i>								
	Niles, Warren, Ohio Sharon, Pa.	5.10 <i>R3, S1</i>	6.275 <i>R3</i>	6.875 <i>R3, 7.65 R3*</i>	6.775 <i>S1</i>	7.225 <i>S1*, R3</i>	7.525 <i>R3, S1</i>	9.275 <i>R3, S1</i>				9.10 <i>R3</i>		
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 <i>U1, J3, P6</i>	6.275 <i>U1, J3, P6</i>	6.875 <i>U1, J3, P6</i>	6.775 <i>U1</i>	7.50 <i>E3*</i>		7.525 <i>U1, J3</i>	9.275 <i>U1, J3</i>	10.025 <i>U1, J3</i>	6.40 <i>A5, J3, P6</i>	10.40 <i>W5, J3</i>	9.10 <i>U1, J3</i>	7.85 <i>U1, J3</i>
	Fairmont, W. Va.	5.10 <i>P7</i>	6.275 <i>P7</i>								6.40 <i>P7</i>			
	Youngstown, Ohio	5.10 <i>U1, Y1</i>	6.275 <i>Y1</i>	7.50 <i>J3*</i>	6.775 <i>Y1</i>		7.525 <i>Y1</i>	9.275 <i>Y1</i>		6.40 <i>Y1</i>				
SOUTH	Fontana, Cal.	5.825 <i>K1</i>	7.40 <i>K1</i>				8.25 <i>K1</i>	10.40 <i>K1</i>			11.05 <i>K1</i>	9.75 <i>K1</i>		
	Geneva, Utah	5.20 <i>C7</i>												
	Kansas City, Mo.										6.65 <i>S2</i>			
	Los Angeles, Torrance, Cal.										7.20 <i>B2</i>			
	Minneapolis, Colo.										6.65 <i>C6</i>			
SOUTH	San Francisco, Niles, Pittsburgh, Cal.	5.80 <i>C7</i>	7.225 <i>C7</i>	7.825 <i>C7</i>							7.20 <i>C7</i>	11.05 <i>C7</i>	9.75 <i>C7</i>	
	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	5.10 <i>T2, R3</i>	6.275 <i>T2, R3</i>	6.875 <i>T2, R3</i>	6.775 <i>T2</i>						6.40 <i>T2, R3</i>	10.50 <i>T2</i>	9.20 <i>T2</i>	
SOUTH	Houston, Texas										6.65 <i>S2</i>			

* Electrogalvanized sheets.

(Effective Jan. 26, 1959)

*7.425 at Sharon-Niles is 7.225

THE IRON AGE, January 29, 1959

IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.										
STEEL PRICES		BARS					PLATES				WIRE	
		Carbon Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 B3	9.025 B3	8.30 B3					
	Buffalo, N. Y.	5.675 R3, B3	5.675 R3, B3	7.70 B5	6.725 B3, R3	9.025 B3, B5	8.30 B3	5.30 B3				8.00 W6
	Claymont, Del.							5.30 C4		7.50 C4	7.95 C4	
	Coatesville, Pa.							5.30 L4		7.50 L4	7.95 L4	
	Conshohocken, Pa.							5.30 A2	6.375 A2	7.50 A2	7.95 A2	
	Harrisburg, Pa.							5.30 P2	6.475 P2			
	Milton, Pa.	5.825 M7	5.825 M7									
	Hartford, Conn.			8.15 R3		9.325 R3						
	Johnstown, Pa.	5.675 B3	5.675 B3		6.725 B3		8.30 B3	5.30 B3		7.50 B3	7.95 B3	8.00 B3
	Fairless, Pa.	5.825 U1	5.825 U1		6.875 U1							
	Newark, Camden, N. J.			8.10 W10, P10		9.20 W10, P10						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 W10, 8.15 J3	6.80 N8	9.175 N8						
	Sparrows Pt., Md.		5.675 B3					5.30 B3		7.50 B3	7.95 B3	8.10 B3
	Palmer, Worcester, Roadville, Mansfield, Mass.			8.20 B5, C14		9.325 A5, B5						8.30 A5, W6
	Spring City, Pa.			8.10 K4		9.20 K4						
	Alto, Ill.	5.875 L1										8.20 L1
	Ashland, Newport, Ky.							5.30 A7, A9		7.50 A9	7.95 A7	
	Canton, Massillon, Mansfield, Ohio	6.15* R3		7.65 R3, R2	6.725 R3 6.475 T5	9.025 R3, R2 8.775 T5		5.30 E2				
MIDDLE WEST	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 U1, R3, W8, N4, P13	5.675 U1, R3, N4, P13, W8, B5, L2, N8, N9	7.65 W10, W8, B5, L2, N8	6.725 U1, R3, W8	9.025 A5, W10, W8, L2, N8, B5	8.30 U1, W8, R3	5.30 U1, A1, W8, I3	6.375 U1, W8, I3	7.50 U1, W8	7.95 U1, W8	8.00 A5, R3, W8, N4, K2, W7
	Cleveland, Ohio Elyria, Ohio	5.675 R3	5.675 R3	7.85 A5, C13, C18		9.025 A5, C13, C18	8.30 R3	5.30 R3, J3	6.375 J3		7.95 R3, J3	8.00 A5, C13, C18
	Detroit, Mich.	5.675 G3	5.675 G3	7.90 P3 7.85 P8, B5 7.65 R5	6.725 R5, G3	9.025 R5 9.225 B5, P3, P8	8.30 G3	5.30 G3		7.50 G3	7.95 G3	
	Duluth, Minn.											8.00 A5
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 U1, J3, Y1	5.675 U1, J3, Y1	7.65 R3, J3	6.725 U1, J3, Y1	9.025 R3, M4	8.30 U1, Y1	5.30 U1, J3, Y1	6.375 J3, Y1	7.50 U1, Y1	7.95 U1, Y1, J3	8.10 M4
	Granite City, Ill.								5.40 G2			
	Kokomo, Ind.		5.775 C9									8.10 C9
	Sterling, Ill.	5.775 N4	5.775 N4					5.30 N4				8.10 K2
	Niles, Warren, Ohio Sharon, Pa.			7.65 C10	6.725 C10	9.025 C10		5.30 R3, S1		7.50 S1	7.95 R3, S1	
	Owensboro, Ky.	5.675 G5			6.725 G5							
	Pittsburgh, Midland, Dumas, Aliquippa, Pa.	5.675 U1, J3	5.675 U1, J3	7.65 A5, B4, R3, J3, C11, W10, S9, C8, M9	6.725 U1, J3, C11, B7	9.025 A5, W10, R3, S9, C11, C8, M9	8.30 U1, J3	5.30 U1, J3	6.375 U1, J3	7.50 U1, J3, B7	7.95 U1, J3, B7	8.00 A5, J3, P6
	Portsmouth, Ohio											8.00 P7
	Weirton, Wheeling, Fellanshe, W. Va.							5.30 W5				
	Youngstown, Ohio	5.675 U1, R3, Y1	5.675 U1, R3, Y1	7.85 A1, Y1, F2	6.725 U1, Y1	9.025 Y1, F2	8.30 U1, Y1	5.30 U1, R3, Y1		7.50 Y1	7.95 U1, Y1	8.00 Y1
WEST	Emeryville, Cal. Fontana, Cal.	6.425 J5 6.375 K1	6.425 J5 6.375 K1		7.775 K1		9.00 K1	6.10 K1		8.30 K1	8.75 K1	
	Genera, Utah							5.30 C7			7.95 C7	
	Kansas City, Mo.	5.925 S2	5.925 S2		6.975 S2		8.55 S2					8.25 S2
	Los Angeles, Torrance, Cal.	6.375 C7, B2	6.375 C7, B2	9.10 R3, P14, S12	7.775 B2	11.00 P14, S12	8.625 B2					8.95 B2
	Minnequa, Colo.	6.125 C6	6.125 C6					6.15 C6				8.25 C6
	Portland, Ore.	6.425 D2	6.425 D2									
	San Francisco, Niles, Pittsburgh, Cal.	6.375 C7 6.425 B2	6.375 C7 6.425 B2				8.675 B2					8.95 C7, C6
	Seattle, Wash.	6.425 B2, N6	6.425 B2				8.675 B2	6.20 B2		8.40 B2	8.85 B2	
	Atlanta, Ga.	5.875 A8	5.875 A8									8.00 A8
	Fairfield City, Ala. Birmingham, Ala.	5.875 T2, R3, C16	5.875 T2, R3, C16				8.30 T2	5.30 T2, R3			7.95 T2	8.00 T2, R3
SOUTH	Houston, Ft. Worth, Lone Star, Texas	5.925 S2	5.925 S2		6.875 S2		8.55 S2	5.40 S2		7.60 S2	8.05 S2	8.25 S2

† Merchant Quality—Special Quality 35¢ higher.

(Effective Jan. 26, 1959)

* Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
 A2 Alan Wood Steel Co., Conshohocken, Pa.
 A3 Allegheny Ludlum Steel Corp., Pittsburgh
 A4 American Cladmetals Co., Carnegie, Pa.
 A5 American Steel & Wire Div., Cleveland
 A6 Angel Nail & Chaplet Co., Cleveland
 A7 Armcro Steel Corp., Middletown, Ohio
 A8 Atlanta Steel Co., Atlanta, Ga.
 A9 Acme-Newport Steel Co., Newport, Ky.
 B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
 B2 Bethlehem Pacific Coast Steel Corp., San Francisco
 B3 Bethlehem Steel Co., Bethlehem, Pa.
 B4 Blair Strip Steel Co., New Castle, Pa.
 B5 Bliss & Laughlin Inc., Harvey, Ill.
 B6 Brook Plant, Wickwire-Spencer Steel Div., Belding, Pa.
 B7 A. M. Byers, Pittsburgh
 B8 Braburn Alloy Steel Corp., Braburn, Pa.
 C1 Calstrip Steel Corp., Los Angeles
 C2 Carpenter Steel Co., Reading, Pa.
 C4 Claymont Products Dept., Claymont, Del.
 C6 Colorado Fuel & Iron Corp., Denver
 C7 Columbia Ceneva Steel Div., San Francisco
 C8 Columbia Steel & Shafing Co., Pittsburgh
 C9 Continental Steel Corp., Kokomo, Ind.
 C10 Copperweld Steel Co., Pittsburgh, Pa.
 C11 Crucible Steel Co. of America, Pittsburgh
 C13 Cuyahoga Steel & Wire Co., Cleveland
 C14 Compressed Steel Shafing Co., Readville, Mass.
 C15 G. O. Carlson, Inc., Thorndale, Pa.
 C16 Connors Steel Div., Birmingham
 C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
 D1 Detroit Steel Corp., Detroit
 D2 Driver Co., Newark, N. J.
 D3 Driver Harris Co., Harrison, N. J.
 D4 Dickson Weatherproof Nail Co., Evanston, Ill.
 E1 Eastern Stainless Steel Corp., Baltimore
 E2 Empire-Reeves Steel Corp., Mansfield, O.
 E3 Enamel Products & Plating Co., McKeesport, Pa.
 F1 Firth Sterling, Inc., McKeesport, Pa.
 F2 Fitzsimons Steel Corp., Youngstown
 F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
 G3 Great Lakes Steel Corp., Detroit
 G4 Greer Steel Co., Dover, O.
 G5 Green River Steel Corp., Owenboro, Ky.
 H1 Hanna Furnace Corp., Detroit
 I2 Ingersoll Steel Div., Chicago
 I3 Inland Steel Co., Chicago
 I4 Interlake Iron Corp., Cleveland
 J1 Jackson Iron & Steel Co., Jackson, O.
 J2 Jessop Steel Corp., Washington, Pa.
 J3 Jones & Laughlin Steel Corp., Pittsburgh
 J4 Joslyn Mfg. & Supply Co., Chicago
 J5 Judson Steel Corp., Emeryville, Calif.
 K1 Kaiser Steel Corp., Fontana, Calif.
 K2 Keystone Steel & Wire Co., Peoria
 K3 Koppen Co., Granite City, Ill.
 K4 Keystone Drawn Steel Co., Spring City, Pa.
 L1 Laclede Steel Co., St. Louis
 L2 La Salle Steel Co., Chicago
 L3 Lone Star Steel Co., Dallas
 L4 Lukens Steel Co., Coatesville, Pa.
 M1 Mahoning Valley Steel Co., Niles, O.
 M2 McLouth Steel Corp., Detroit
 M3 Mercer Tube & Mfg. Co., Sharon, Pa.
 M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
 M6 Mystic Iron Works, Everett, Mass.
 M7 Milton Steel Products Div., Milton, Pa.
 M8 Mill Strip Products Co., Evanston, Ill.
 M9 Moltrup Steel Products Co., Beaver Falls, Pa.
 N1 National Supply Co., Pittsburgh
 N2 National Tube Div., Pittsburgh
 N4 Northwestern Steel & Wire Co., Sterling, Ill.
 N6 Northwest Steel Rolling Mills, Seattle
 N7 Newman Crosby Steel Co., Pawtucket, R. I.
 N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
 N9 Nelson Steel & Wire Co.
 O1 Oliver Iron & Steel Co., Pittsburgh
 O2 Oregon Steel Mills, Portland
 P1 Page Steel & Wire Div., Monessen, Pa.
 P2 Phoenix Steel Corp., Phoenixville, Pa.
 P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
 P4 Pittsburgh Coke & Chemical Co., Pittsburgh
 P5 Pittsburgh Screw & Bolt Co., Pittsburgh
 P6 Pittsburgh Steel Co., Pittsburgh
 P7 Portmouth Div., Detroit Steel Corp., Detroit

P8 Plymouth Steel Co., Detroit
 P9 Pacific States Steel Co., Niles, Cal.
 P10 Precision Drawn Steel Co., Camden, N. J.
 P11 Production Steel Strip Corp., Detroit
 P13 Phoenix Mfg. Co., Joliet, Ill.
 P14 Pacific Tube Co.
 P15 Philadelphia Steel and Wire Corp.
 R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
 R3 Republic Steel Corp., Cleveland
 R4 Roebling Sons Co., John A., Trenton, N. J.
 R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
 R6 Rodney Metals, Inc., New Bedford, Mass.
 R7 Rome Strip Steel Co., Rome, N. Y.
 S1 Sharon Steel Corp., Sharon, Pa.
 S2 Sheffield Steel Div., Kansas City
 S3 Shenango Furnace Co., Pittsburgh
 S4 Simonds Saw and Steel Co., Fitchburg, Mass.
 S5 Sweet's Steel Co., Williamsport, Pa.
 S7 Stanley Works, New Britain, Conn.
 S8 Superior Drawn Steel Co., Monaca, Pa.
 S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
 S10 Seneca Steel Service, Buffalo
 S11 Southern Electric Steel Co., Birmingham
 S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
 T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
 T2 Tennessee Coal & Iron Div., Fairfield
 T3 Tennessee Products & Chem. Corp., Nashville
 T4 Thomas Strip Div., Warren, O.
 T5 Timken Steel & Tube Div., Canton, O.
 T7 Texas Steel Co., Fort Worth
 T8 Thompson Wire Co., Boston
 U1 United States Steel Corp., Pittsburgh
 U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
 U3 Ulbrich Stainless Steels, Wallingford, Conn.
 U4 U. S. Pipe & Foundry Co., Birmingham
 W1 Wallingford Steel Co., Wallingford, Conn.
 W2 Washington Steel Corp., Washington, Pa.
 W3 Weirton Steel Co., Weirton, W. Va.
 W4 Wheatland Tube Co., Wheatland, Pa.
 W5 Wheeling Steel Corp., Wheeling, W. Va.
 W6 Wickwire Spencer Steel Div., Buffalo
 W7 Wilson Steel & Wire Co., Chicago
 W8 Wisconsin Steel Div., S. Chicago, Ill.
 W9 Woodward Iron Co., Woodward, Ala.
 W10 Wyckoff Steel Co., Pittsburgh
 W12 Wallace Barnes Steel Div., Bristol, Conn.
 Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (per cent) f.o.b. mills. Base price about \$200 per net ton.

STANDARD T. & C.	BUTTWELD												SEAMLESS												
	1/2 in.		3/4 in.		1 in.		1 1/4 in.		1 1/2 in.		2 in.		2 1/2-3 in.		2 in.		2 1/2 in.		3 in.		3 1/2-4 in.				
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	
Sparrows Pt. B3	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	...	...	...	...	...	...	...	...	...	...	...
Youngstown R3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	...	...	...	...	...	...	...	...	...	...	...
Fontana K1	*10.75	*26.00	*7.15	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	*0.75	*15.50	...	...	...	...	...	...	...	...	...	...	...
Pittsburgh J3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50	...	...
Alton, Ill. L1	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	...	...	...	...	...	...	...	...	...	...	...
Sharon M3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	...	...	...	...	...	...	...	...	...	...	...
Fairless N2	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50	...	...	...	...	...	...	...	...	...	...	...
Pittsburgh N1	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50	...	...
Wheeling W3	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	...	...	...	...	...	...	...	...	...	...	...
Wheatland W4	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50	...	...
Youngstown Y1	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50	...	...
Indiana Harbor Y1	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50	...	...	...	...	...	...	...	...	...	...	...
Lorain N2	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50	...	...
EXTRA STRONG PLAIN ENDS																									
Sparrows Pt. B3	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	...	...	...	...	...	...	...	...	...	...	...
Youngstown R3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	*2.5	14.75	1.25	15.25	1.75	15.75	0.50	...	...	...	...	...	...	...	...	...	...	...
Fairless N2	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	...	...	...	...	...	...	...	...	...	...	...
Fontana K1	+6.25	*2.25	0.75	...	1.25	...	1.75	...	2.25	...	2.75	...	3.25	...	...	...	...	...	...	...	...	...	...	...	...
Pittsburgh J3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	*2.5	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50	...	...
Alton, Ill. L1	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50	...	...	...	...	...	...	...	...	...	...	...
Sharon M3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	*2.5	14.75	1.25	15.25	1.75	15.75	0.50	...	...	...	...	...	...	...	...	...	...	...
Pittsburgh N1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	*2.5	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50	...	...
Wheeling W3	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	*2.5	14.75	1.25	15.25	1.75	15.75	0.50	...	...	...	...	...	...	...	...	...	...	...
Wheatland W4	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	*2.5	14.75	1.25	15.25	1.75	15.75	0.50	...	...	...	...	...	...	...	...	...	...	...
Youngstown Y1	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	*2.5	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50	...	...
Indiana Harbor Y1	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50	...	...
Lorain N2	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	*2.5	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50	...	...

Threads only, butt-welded and seamless, 2 1/4 pt. higher discount. Plain ends, butt-welded and seamless, 3-in. and under, 3 1/2 pt. higher discount.
 Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/2, 2 1/2 and 3-in., 1 pt.; e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2 and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.50¢ per lb.

(Effective Jan. 26, 1959)

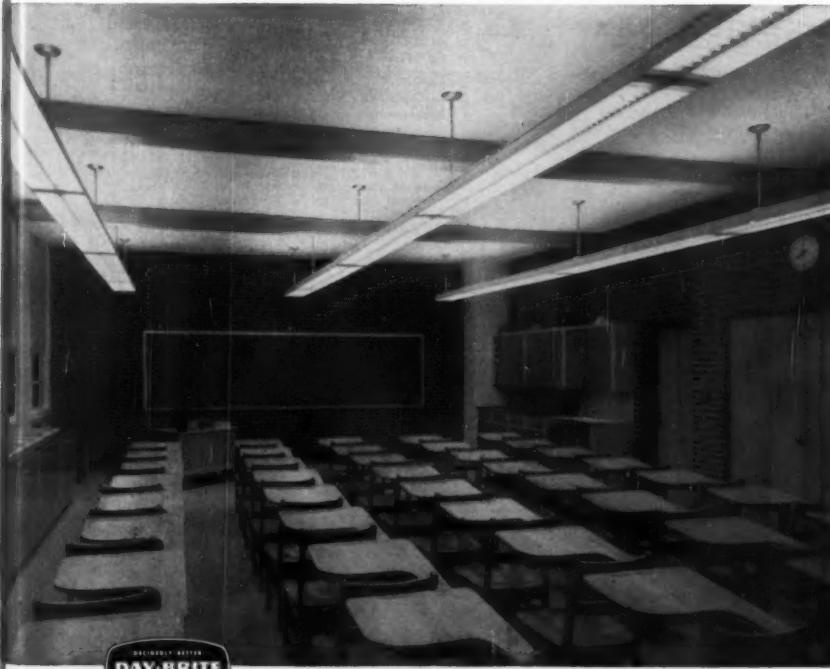
THE IRON AGE, January 29, 1959

Operator at Day-Brite plant is lathe-cutting fixture stems fabricated from Youngstown Cold-Rolled Sheets.



Accent on excellence

Youngstown hot and cold-rolled sheets



Students attending the new, modern Concord City School at Concord, North Carolina, will benefit by the latest developments in Day-Brite higher-intensity school lighting. All areas of the classroom will afford the greatest possible visual comfort—without any annoying reflected glare.

These beautiful, scientifically-designed fixtures, manufactured by Day-Brite Lighting, Inc., of St. Louis, Missouri, are fabricated from Youngstown Hot and Cold-Rolled Steel Sheets. Close quality-control by Youngstown guarantees Day-Brite a sheet of unwavering uniformity that makes possible long, trouble-free production runs—boosts profits, cuts over-all costs.

Wherever steel becomes a part of things you make, the high standards of Youngstown quality, the personal touch in Youngstown service will help you create products with an "accent on excellence".



**THE
YOUNGSTOWN
SHEET AND TUBE COMPANY**

*Manufacturers of Carbon, Alloy and Tool Steel
Youngstown, Ohio*

To identify producers, see Key on preceding page

TOOL STEEL

F.o.b. mill	W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	—	1.84	T-1
18	4	1	—	—	5	2.545	T-4
18	4	2	—	—	—	2.005	T-2
1.5	4	1.5	8	—	—	1.20	M-1
6	4	3	6	—	—	1.59	M-3
6	4	2	5	—	—	1.345	M-2
High-carbon chromium	—	—	—	—	—	.955	D-3, D-5
Oil hardened manganese	—	—	—	—	—	.505	O-2
Special carbon	—	—	—	—	—	.38	W-1
Extra carbon	—	—	—	—	—	.38	W-1
Regular carbon	—	—	—	—	—	.325	W-1
Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.	—	—	—	—	—	—	—

CLAD STEEL

Base prices, cents per lb f.o.b.

Stainless Type	Plate (L4, C4, A3, J2)			Sheet (J2)		
	Cladding	10 pct	15 pct	20 pct	20 pct	20 pct
302	—	—	—	—	37.50	—
304	—	28.80	31.55	34.30	40.00	—
316	—	42.20	46.25	50.25	58.75	—
321	—	34.50	37.75	41.05	47.25	—
347	—	40.80	44.65	48.55	57.00	—
405	—	24.60	26.90	29.25	—	—
410	—	22.70	24.85	27.00	—	—
430	—	23.45	25.65	27.90	—	—

CR Strip (S9) Copper, 10 pct, 2 sides, 42.05; 1 side, 35.55.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untested
Bessemer U1	5.75	6.725	7.25	—	—	15.35
Cleveland R3	—	—	—	10.10	—	—
St. Chicago R3	—	—	—	—	10.10	—
Ensley 72	5.75	6.725	—	—	6.875	—
Fairfield 72	—	6.725	—	10.10	6.875	—
Gary U1	5.75	—	—	—	6.875	—
Ind. Harbor J3	—	—	—	—	—	—
Johnstown B3	—	6.725	—	—	—	—
Joliet U1	—	—	7.25	—	—	—
Kansas City S2	—	—	—	10.10	—	—
Lackawanna B3	5.75	6.725	7.25	—	6.875	15.35
Lebanon B3	—	—	7.25	—	—	15.35
Minnequa C6	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh P5	—	—	—	—	—	14.75
Pittsburgh J3	—	—	—	10.10	—	—
Seattle B2	—	—	—	—	6.75	15.85
Steedon B3	5.75	—	7.25	—	6.875	—
Struthers Y1	—	—	—	—	10.10	—
Terrace C7	—	—	—	—	6.75	—
Williamsport S5	—	6.725	—	—	10.10	—
Youngstown R3	—	—	—	—	—	—

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsburg, Pa.	\$14.50
Foundry, beehive (f.o.b.)	\$18.00 to \$18.50
Foundry oven coke	—
Buffalo, del'd	\$31.75
Detroit, f.o.b.	30.50
New England, del'd	33.55
Kearney, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedenland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1958 season. Freight changes for seller's account. Gross Ton	
Openhearth lump	\$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage	Hot-Rolled	Cold-Reduced (Coiled or Cut Length)	
		Semi- Processed	Fully Processed
Field	9.875	9.875	9.875
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	—	12.475	—
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30	—	—
Grain Oriented			
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (A9); Niles, O. (S1); Vandergrift (U1); Warren, O. (R3); Zanesville, Butler (A7).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	64	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00	—	—	—
3	40	39.25	—	—	—
2 1/2	30	41.50	—	—	—
2	24	64.00	—	—	—

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky...	\$185.00
High duty (except Salina, Pa., add \$5.00)	140.00
Medium duty	125.00
Low duty (except Salina, Pa., add \$2.00)	103.00
Ground fire clay, net ton, bulk...	22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala. \$158.00

Childs, Hays, Latrobe, Pa. 163.00

Chicago District 168.00

Western Utah 183.00

California 165.00

Super Duty Hays, Pa., Athens, Tex., Windingham, Warren, O., Morrisville 163.00-168.00

Silica cement, net ton, bulk, Latrobe 29.75

Silica cement, net ton, bulk, Chicago 26.75

Silica cement, net ton, bulk, Ensley, Ala. 27.75

Silica cement, net ton, bulk, Mt. Union 25.75

Silica cement, net ton, bulk, Utah and Calif. 39.00

Silica cement, net ton, bulk, Calif. 39.00

Chrome Brick Per net ton

Standard chemically bonded, Balt. \$109.00

Standard chemically bonded, Curtin, Pa. 119.00

Burned, Balt. 103.00

Magnesite Brick Standard, Baltimore \$140.00

Chemically bonded, Baltimore 119.00

Grain Magnesite St. % to 1/2-in. grains

Domestic, f.o.b. Baltimore in bulk. \$73.00

Domestic, f.o.b. Chewalah, Wash., Luning, Nev. 15.00

in bulk 46.00

in sacks 52.00-54.00

Dead Burned Dolomite Per net ton

F.o.b. bulk, producing points in:

Pa., W. Va., Ohio \$16.75

Missouri Valley 15.00

Midwest 17.00

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails		Woven Wire Fence		1/4" Fence Posts		Single Loop Barb Tie		Galv. Barbed and Twisted Barbless Wire		March. Wire Astd		March. Wire Galv.	
	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col	Col
Alabama City R3	173	187	—	212	193	9.00	9.55	—	—	—	—	—	—	—
Albuquerque B3**	173	190	—	217	196	9.00	9.65	—	—	—	—	—	—	—
Atlanta A3**	175	192	214	194	198	9.00	9.55	—	—	—	—	—	—	—
Bartowville K2**	175	192	214	194	198	9.00	9.55	—	—	—	—	—	—	—
Buffalo W6	175	192	217	198	198	9.25	9.80	—	—	—	—	—	—	—
Chicago R3	173	187	212	193	190	9.00	9.55	—	—	—	—	—	—	—
Cleveland A5	173	187	212	193	190	9.00	9.55	—	—	—	—	—	—	—
Crawf'day, M4**	175	192	214	198	198	9.10	9.75	—	—	—	—	—	—	—
Donora, Pa. A5	173	187	212	193	190	9.00	9.55	—	—	—	—	—	—	—
Duluth A5	173	187	212	193	190	9.00	9.55	—	—	—	—	—	—	—
Fairfield, Ala. T2	173	187	212	193	190	9.00	9.55	—	—	—	—	—	—	—
Galveston B2**	175	189	214	195	198	9.10	9.65	—	—	—	—	—	—	—
Houston S2	178	192	217	198	198	9.25	9.80	—	—	—	—	—	—	—
Jacksonville M4**	174	197	219	203	203	9.10	9.75	—	—					



NEW

GREATER CAPACITIES...

NEW

TORQUE CONTROLLED FEED

The Incomparable "Buffalo" R-P-Mster

Here's news from the makers of the first and finest of the variable speed drilling machines! The "Buffalo" R-P-Mster Drills have been redesigned to bring you greater capacities. The No. 1A is rated at 1" in mild steel; the No. 2A is rated at 1½" in mild steel, the No. 3A at 2". Of even greater news to production management and machine operator alike is the exclusive "Buffalo" Torque Controlled Power Feed. Now you can use maximum speed and feed for the size hole being drilled without concern over damage to drill or machine gearing. This torque control on the feed shaft positively eliminates the danger of overloading the machine to the break-down point.

Here is more drilling ability per dollar than competitive equipment ever offered. You'll still find the same forward-looking "Buffalo" engineering features . . . the same husky, long-life construction that's typical of "Buffalo" products.

But you'll like these new machines most of all when you try them out. Because only by operating the new "Buffalo" R-P-Mster Drills can you really appreciate the new concept of drilling ease and smoothness that you know will please your operators . . . that is certain to increase the quality, quantity and profitability of your output.

Phone your nearby "Buffalo" machine tool dealer today. He'll be glad to arrange a demonstration of the new higher capacity, lower priced "Buffalo" R-P-Msters. Or write us direct for Bulletin 3257-C.



The "Buffalo" R-P-Mster is available in pedestal models — 1 to 6 spindles.

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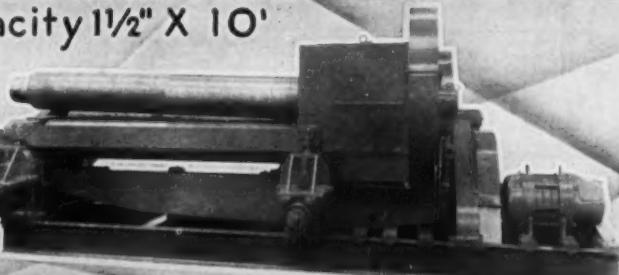
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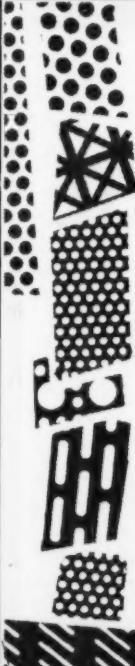
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We can guarantee sheets that are perfectly flat, straight, parallel on sides, and free from buckle or camber.

A tremendous variety of screens. Our modern tool and machine shop is constantly building new dies placing us in a position to construct special dies as conditions may demand.

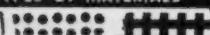
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small enough for personal at-
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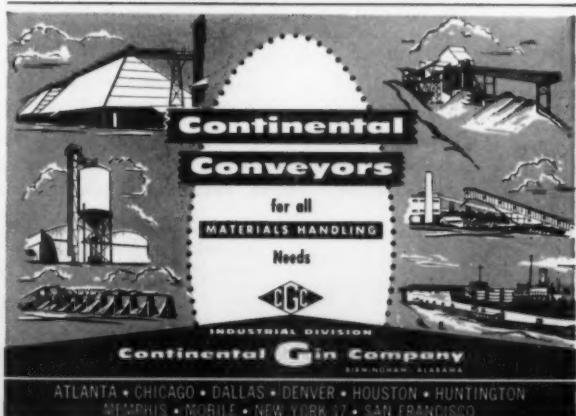
The saw blade of high speed steel moves at a speed of 480 strokes per minute with a 2 1/2" thrust. Easily cuts any profile metal and steel or cast iron pipe up to 6" diameter. Driven by 250 Watt Universal Motor, 200 Watt 3 Phase motor or a 0.5 HP air turbine.

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PIG IRON

Dollars per gross ton, f.o.b.,
subject to switching charges.

Producing Point	Basic	Fdry.	Mill.	Beas.	Low Phos.
Albion, Pa. B6	68.00	68.50	69.00	69.50	.....
Birmingham R3	62.00	62.50*	66.50	.....	.....
Birmingham W9	62.00	62.50*	66.50	.....	.....
Birmingham U4	62.00	62.50*	66.50	.....	.....
Buffalo R3	66.00	66.50	67.00	67.50	.....
Buffalo H1	66.00	66.50	67.00	67.50	.....
Buffalo W6	66.00	66.50	67.00	67.50	.....
Chester P2	66.50	67.00	67.50	.....	.....
Chicago 14	66.00	66.50	66.50	67.00	.....
Cleveland A5	66.00	66.50	66.50	67.00	71.00†
Cleveland R3	66.00	66.50	66.50	67.00	.....
Duluth 14	66.00	66.50	66.50	67.00	71.00†
Erie 14	66.00	66.50	66.50	67.00	71.00†
Everett M6	67.50	68.00	68.50	69.00	.....
Fontana K1	75.00	75.50	.....	.....	.....
Geneva, Utah C7	66.00	66.50	.....	.....	.....
Granite City G2	67.90	68.40	68.90	.....	.....
Hubbard Y1	.....	66.50	.....	.....	.....
Ironon, Utah C7	66.00	66.50	.....	.....	.....
Midland C11	66.00	.....	.....	.....	.....
Minnequa C6	63.00	68.50	69.00	.....	.....
Monesean P6	66.00	.....	.....	.....	.....
Neville's P4	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda T7	66.00	66.50	67.00	67.50	.....
Sharpsville S3	66.00	66.50	67.00	.....	.....
So. Chicago R5	66.00	66.50	66.50	67.00	.....
So. Chicago W8	66.00	66.50	66.50	67.00	.....
Swedenland A2	68.00	68.50	69.00	69.50	.....
Toledo 14	66.00	66.50	66.50	67.00	.....
Trey, N. Y. R3	68.00	68.50	69.00	69.50	73.00
Youngstown Y1	.....	66.50	.....	.....	.....

DIFFERENTIALS: Add .75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese portion thereof over 1 pct, \$2 per ton for 0.50 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. Add \$1.00 for 0.31-0.69 pct phosphorus.

Silvery Iron: Buffalo (6 pct), H1, \$79.25; Jackson J1, 14 (Globe Div.), \$78.00; Niagara Falls (15.01-15.50), \$101.00; Keokuk (14.01-14.50), \$103.50; (15.51-16.00), \$106.50. Add \$1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add \$1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.) \$64.00. Add \$1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

(Ferroalloy prices will next appear in the Feb. 5 issue.)

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	420
Ingots, re-roll	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.75	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.50	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	38.00	38.00	31.25	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2; Baltimore, E1; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Detroit, M2; Louisville, O., R5.

Strip: Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; Leechburg, Pa., A3; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R5; S. Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T3, R3; Ft. Wayne, I4; Detroit, R5; Gary, U1; Owensboro, Ky., G5; Bridgeport, Conn., N8.

Bar: Baltimore, A7; S. Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R5; S. Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T3, R3; Ft. Wayne, I4; Detroit, R5; Gary, U1; Owensboro, Ky., G5; Bridgeport, Conn., N8.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, I4; Newark, N. J., D2; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2; Detroit, R5.

Structures: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, U1.

Plates: Baltimore, E1; Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C15; Vandergrift, Pa., U1; Gary, U1.

Forging billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R3; Munhall, Pa., S. Chicago, U1; Owensboro, Ky., G5; Bridgeport, Conn., N8.

(Effective Jan. 26, 1959)

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THE CLEARING HOUSE

Detroit Sales Show Slight Upswing

Used machinery dealers there don't believe a boom is coming, but sales have improved.

Toolroom equipment is in more demand. However, interest in production line units has fallen off.

Used machinery dealers at Detroit have noticed a small upswing in business. But they don't believe a boom is pending.

Tool room equipment is moving fairly well after having been one of the slowest sections of the market over the past year. Lathes, shapers, mills and punch presses are also going fairly well.

As usual, large presses are in demand—but good ones are still hard to find. In general, good equipment is in abundant supply.

Prices Still Flexible—The inventory picture is mixed. Some dealers report they have trimmed inventories and are buying only enough to keep up with demand. Others say they are still adding to their stocks. As one explains: "It's hard to pass up a bargain."

Most dealers say the improved sales picture hasn't brought any general tightening of prices. There is enough equipment around to keep dealers competitive and prices are still flexible. But where the supply is tight, there's a tendency to stick close to the offering price.

Small Shops Active—Dealers will still bargain freely on sales involving older equipment, even though

older machines are moving fairly well. Several dealers report most of these machines are moving to the South, while local buyers are more interested in late-model equipment.

The smaller shops are the market prop. After holding off to see what changes the new year would bring, they are now showing an active interest in equipment. One dealer classed current shoppers as "good prospects." Several months ago the number of inquiries was high but sales continued to lag.

Production Tools Off—If there's a soft spot in the market, it's probably in production equipment. At the time new model car production began last fall, sales picked up. From mid-November through the first half of December production equipment was in demand and there was little price resistance. However, since the holidays demand has eased and buyers are more price conscious.

Cash sales have increased with the generally healthier sales picture, but many customers are still making purchases on credit.

Dealers are optimistic about chances for continued activity through the first quarter. Most believe customers are regaining their confidence and are willing to invest in better equipment. The dealers don't expect demand to reach boom proportions, but they look for a 10 pct increase above the fourth quarter of '58.

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This is one of the five Sandusky Centrifugal Castings supplied to Fluor for use in their "liquid air" converter cartridges. Picture shows part of the 7,000 components housed in each of the 16½-foot cylinders machined by Sandusky to allow only .010" clearance limit between assembly and cylinder wall.

SOLVED by Sandusky Centrifugal Castings:

This difficult precision-cost-delivery problem for the FLUOR PRODUCTS COMPANY.

Sandusky Quality Centrifugal Castings

Types: Rolls, Sleeves, Rings, Bearings, Bushings, Liners, Bands, Drums, Cylinders, Tubes, Shells, Retorts, Pressure Vessels, Pressure Piping

Sizes: From 7" to 54" O.D.—Lengths up to 33 feet

Materials: Stainless, Carbon and Low-Alloy Steels; full range of Copper-Base and Nickel-Base Alloys

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Centrifugally cast of a modified CF8 (Type 304L) stainless steel, each cylinder was machined to finish dimensions 27½" O.D., 26½" I.D., 199" long. The bore, surface finished to 35 micro inches, was held to .005" maximum out-of-roundness and .008" maximum taper.

What is more important, to meet Fluor's difficult assembly problems these large cylinders would have to be able to retain

these carefully machined dimensions.

"The Fluor Products Company Engineers selected Sandusky Centrifugal Castings because of the stringent specifications, critical delivery requirements and competitive cost of this project. This was the first experience with such centrifugally cast products by the Fluor Products Company; and, the Sandusky Foundry and Machine Company people assisted in making this an extremely satisfactory and profitable project."

While you may have entirely different cylindrical design requirements, Sandusky Centrifugal Castings may well provide a similar cost-cutting answer. We would be pleased to have your inquiries.

SANDUSKY



CENTRIFUGAL CASTINGS

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SANDUSKY, OHIO Stainless, Carbon, Low Alloy Steels—Full Range Copper-Base, Nickel-Base Alloys

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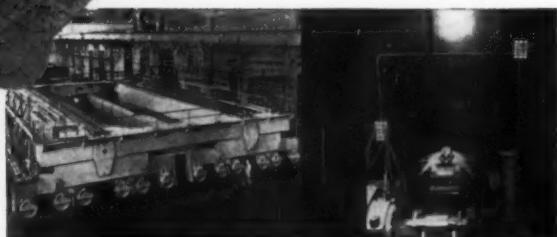
CENTRALIZED LUBRICATING SYSTEMS



Trolley wheel bearings receive the exact amount of lubricant needed in a matter of seconds with Trabon Centralized Lubricating Systems installed on this world's largest ladle crane at an Eastern steel plant. Close up shows Trabon feeder valves which operate on the positive progression principle — most practical and foolproof method yet devised for lubricating rugged industrial equipment.

Trabon
lubricates world's
3 largest ladle
cranes

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One of the three giant Morgan ladle cranes prior to being outfitted with Trabon Centralized Lubricating Systems. Note immensity of the lubricating job if it had to be done manually.

Trabon automatic lubricant pump, two feeders and lubricant lines. Note cam in right foreground which automatically starts the lubricating cycle while crane is in operation. No auxiliary machinery is necessary. Trabon is easily and economically installed on hydraulic, mechanical, electric motorized and pneumatic equipment.



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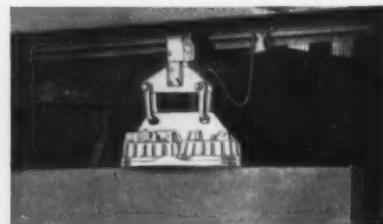
SPECIAL PURPOSE MAGNETS

Designed for specific applications, Cutler-Hammer Magnets can substantially reduce handling costs. As shown in the main illustration, Cutler-Hammer Rail Handling Magnets move multiple rails swiftly, efficiently, and safely.



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These Cutler-Hammer Magnets are designed specifically for handling structural shapes such as I-beams, angles, and channels. Cutler-Hammer Bi-Polar Magnets have played a major role in cutting the cost of classifying and stacking beams for shipment.



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CIRCULAR MAGNETS

Cutler-Hammer Supermagnets are known the world-over for their versatility, durability, and dependability. Perfect for handling iron or steel in any form, hot or cold, and in all kinds of weather. Available in either welded or bolted construction, sizes ranging from 39" to 77".



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